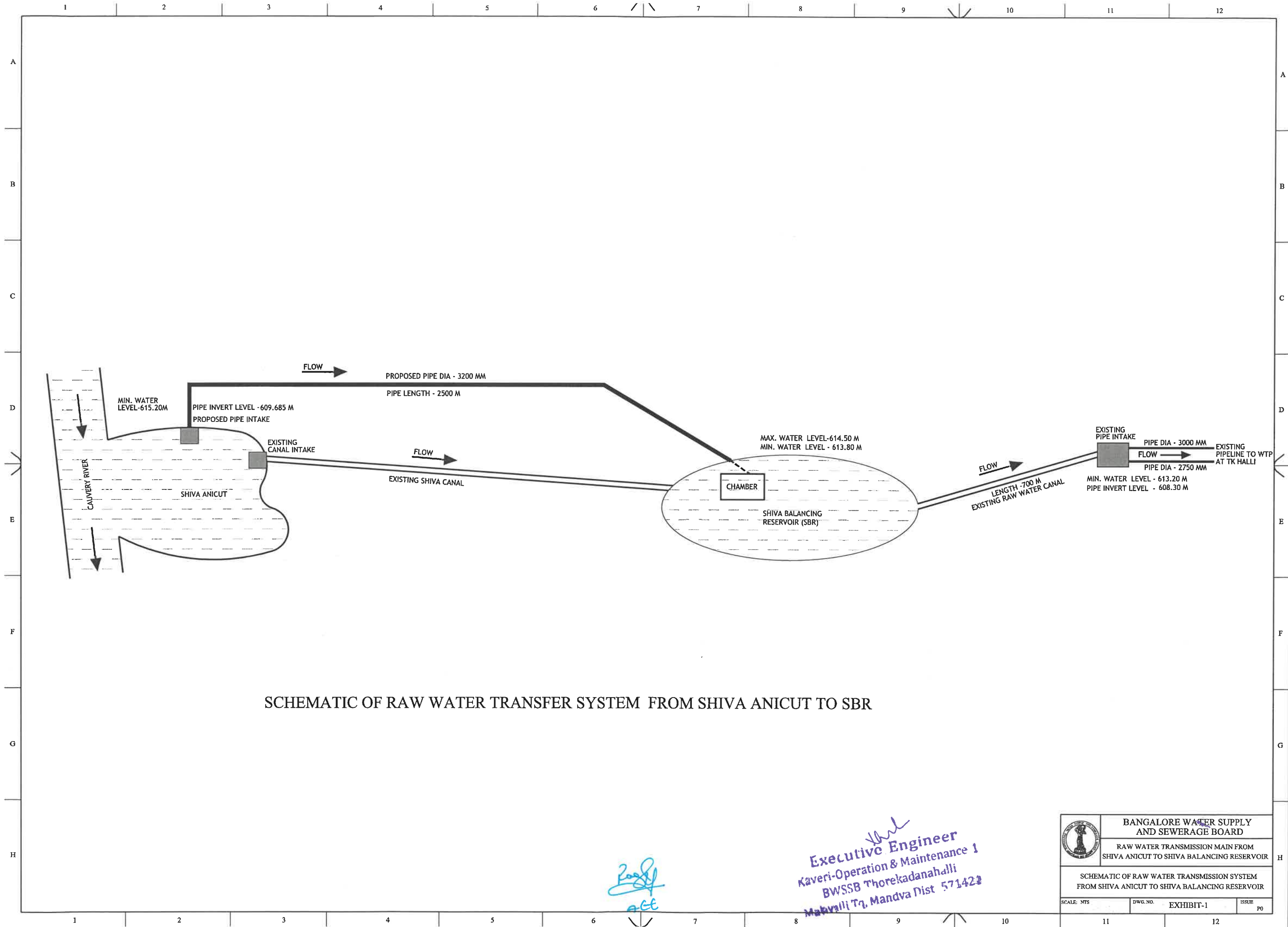
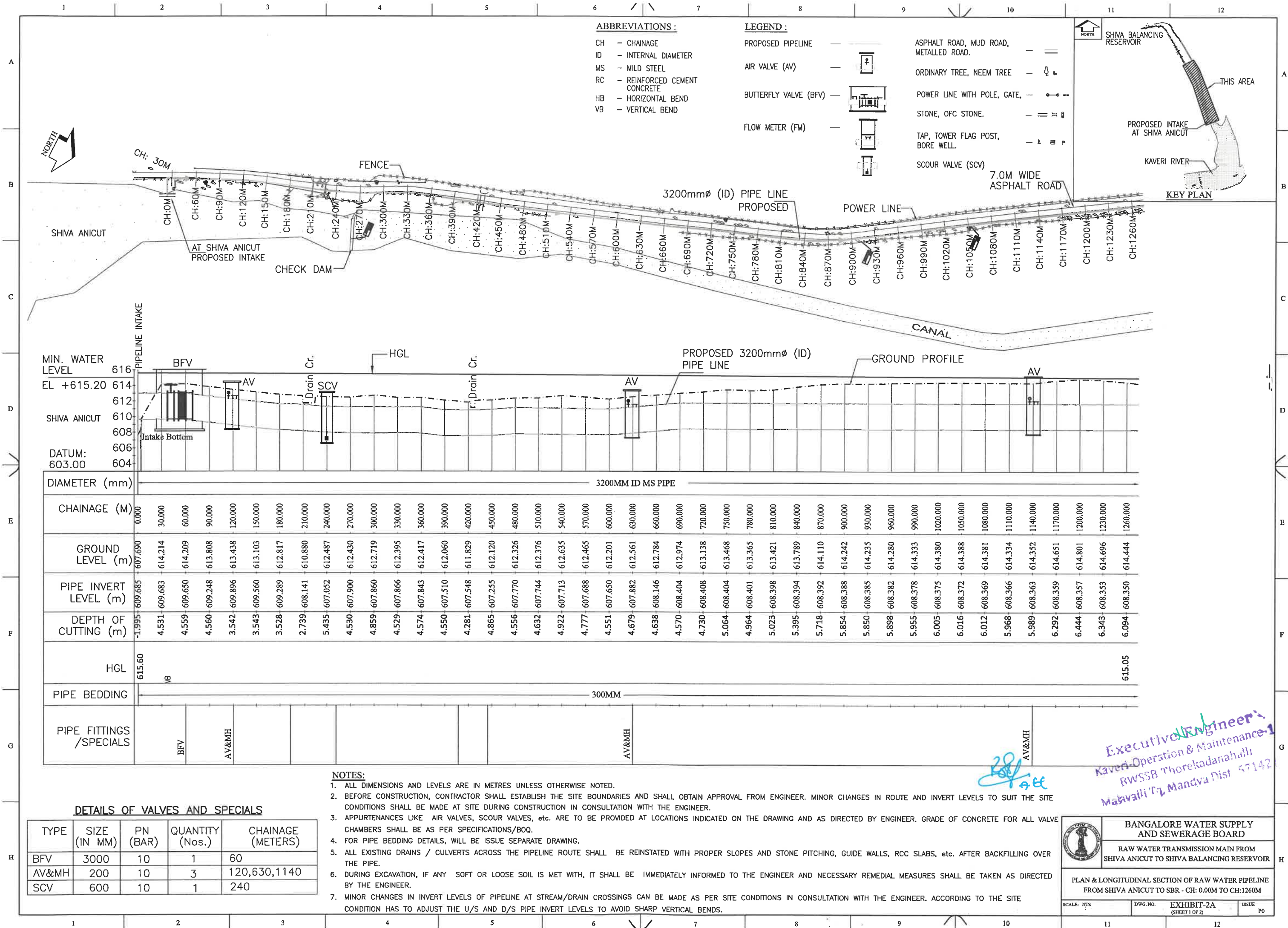
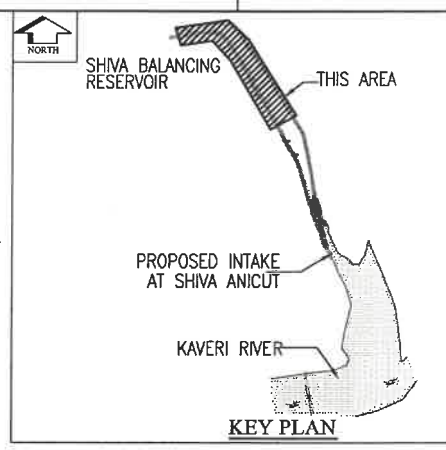
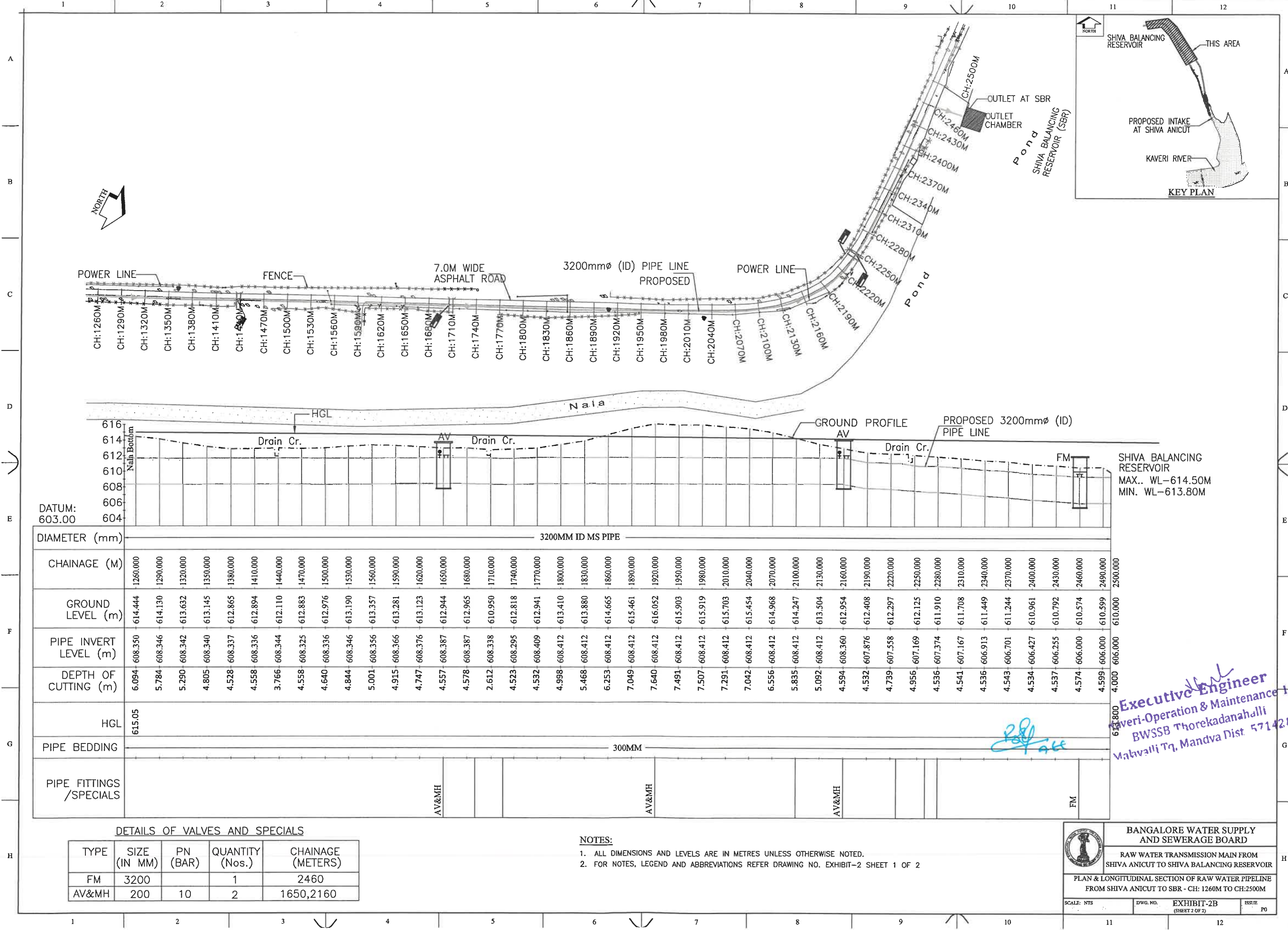








SHIVA BALANCING RESERVOIR
MAX. WL-614.50M
MIN. WL-613.80M

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BWSSB Thorekadanahalli
Mahavalli Tq, Mandya Dist. 571421

DETAILS OF VALVES AND SPECIALS

TYPE	SIZE (IN MM)	PN (BAR)	QUANTITY (Nos.)	CHAINAGE (METERS)
FM	3200		1	2460
AV&MH	200	10	2	1650,2160

- NOTES:
- ALL DIMENSIONS AND LEVELS ARE IN METRES UNLESS OTHERWISE NOTED.
 - FOR NOTES, LEGEND AND ABBREVIATIONS REFER DRAWING NO. EXHIBIT-2 SHEET 1 OF 2

BANGALORE WATER SUPPLY AND SEWERAGE BOARD

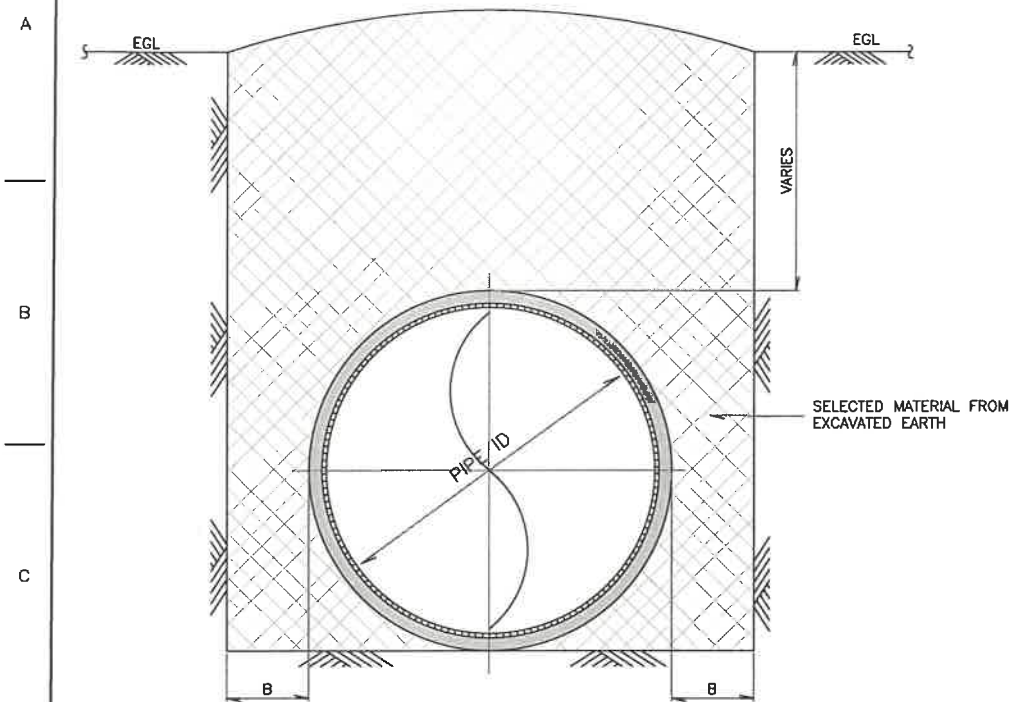
RAW WATER TRANSMISSION MAIN FROM SHIVA ANICUT TO SHIVA BALANCING RESERVOIR

PLAN & LONGITUDINAL SECTION OF RAW WATER PIPELINE FROM SHIVA ANICUT TO SBR - CH: 1260M TO CH:2500M

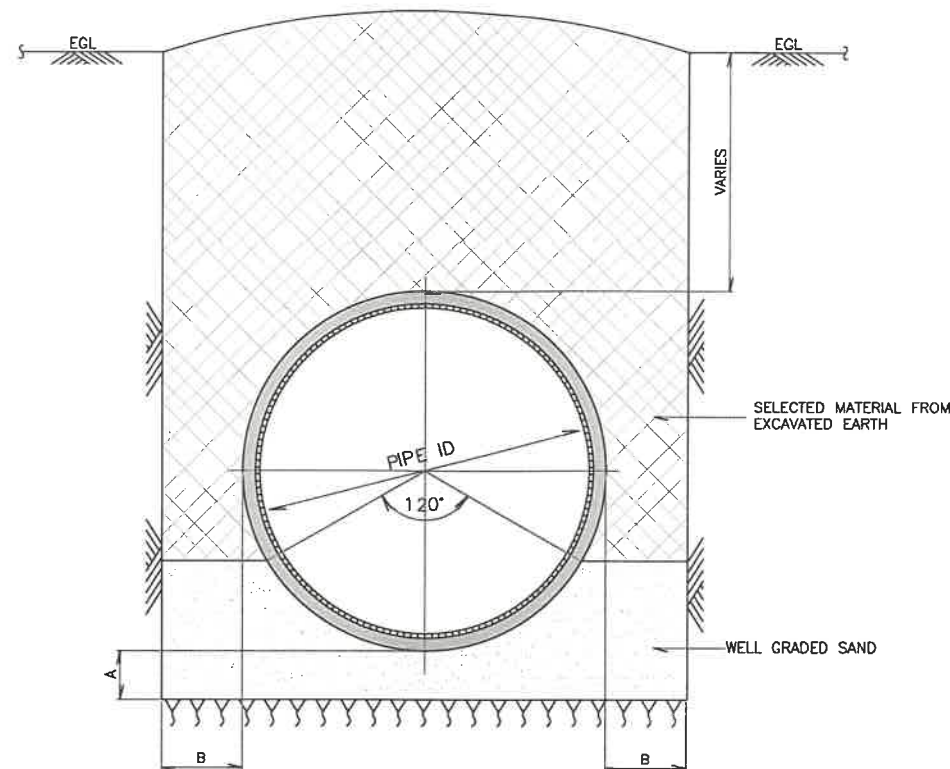
SCALE: NTS

DWG. NO. EXHIBIT-2B (SHEET 2 OF 2)

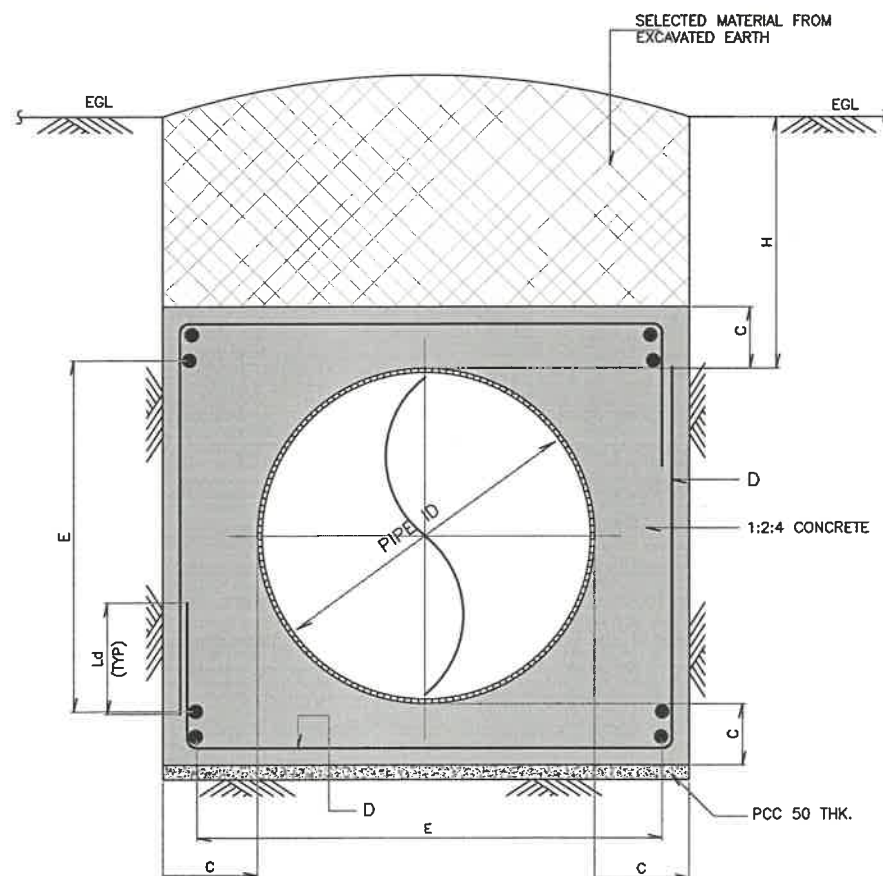
ISSUE P0



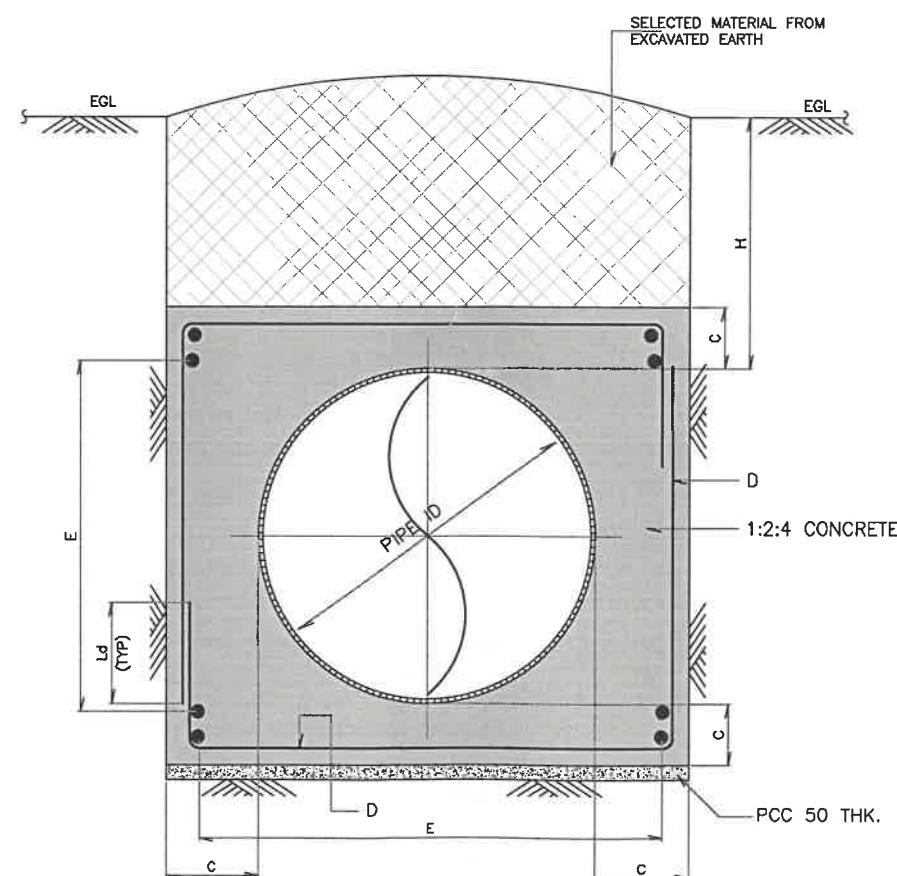
TYPICAL DETAIL OF BEDDING IN SOIL
(REFER TABLE 1 FOR DETAILS)



TYPICAL DETAIL OF BEDDING IN HARD ROCK
(CLASS N BEDDING)
(REFER TABLE 1 FOR DETAILS)



TYPICAL DETAIL OF ENCASEMENT FOR
PIPELINE UNDER THE NALLA/DRAINS/STREAMS
(CLASS A BEDDING - TYPE 1)
(REFER TABLE 2 FOR DETAILS)



TYPICAL DETAIL OF ENCASEMENT FOR
PIPELINE ACROSS MAJOR ROADS
(CLASS A BEDDING - TYPE 2)
(REFER TABLE 3 FOR DETAILS)

TABLE 1: SCHEDULE OF SOIL/CLASS N BEDDING

SL.NO	PIPE ID IN "MM"	BOTTOM CLEARANCE IN "MM" (A)	SIDE CLEARANCE IN "MM" (B)
1.	3200	300	500

TABLE 2: SCHEDULE OF CLASS A BEDDING - TYPE 1

SL.NO	PIPE ID IN "MM"	DEPTH OF PIPE CROWN FROM EGL IN "M" (H)	THICKNESS OF CONCRETE ENCASEMENT IN "MM" (C)	REINFORCEMENT DETAILS	
				(D)	(E)
1.	3200	H = 1.2	350	Y10@150±	Y10@150±
		1.2 ≤ H ≤ 2.5	350	Y10@150±	Y10@150±

TABLE 3: SCHEDULE OF CLASS A BEDDING - TYPE 2

SL.NO	PIPE ID IN "MM"	DEPTH OF PIPE CROWN FROM EGL IN "M" (H)	THICKNESS OF CONCRETE ENCASEMENT IN "MM" (C)	REINFORCEMENT DETAILS	
				(D)	(E)
1.	3200	H = 1.2	350	Y12@150±	Y10@150±
		1.2 ≤ H ≤ 2.5	350	Y12@100±	Y10@150±

NOTES

- ALL DIMENSIONS ARE IN MILLIMETRES AND LEVELS IN METRES UNLESS NOTED.

LEGEND :

- TYP - TYPICAL
- THK. - THICKNESS
- PCC - PLAIN CEMENT CONCRETE
- ID - INTERNAL DIAMETER
- RCC - REINFORCEMENT CONCRETE
- MM - MILLIMETER
- M - METER
- EGL - EXISTING GROUND LEVEL
- Ld - DEVELOPMENT LENGTH

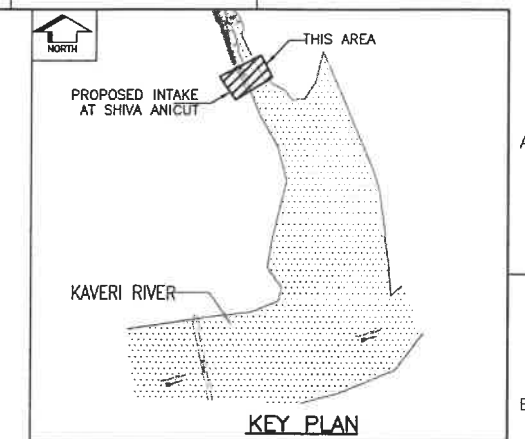
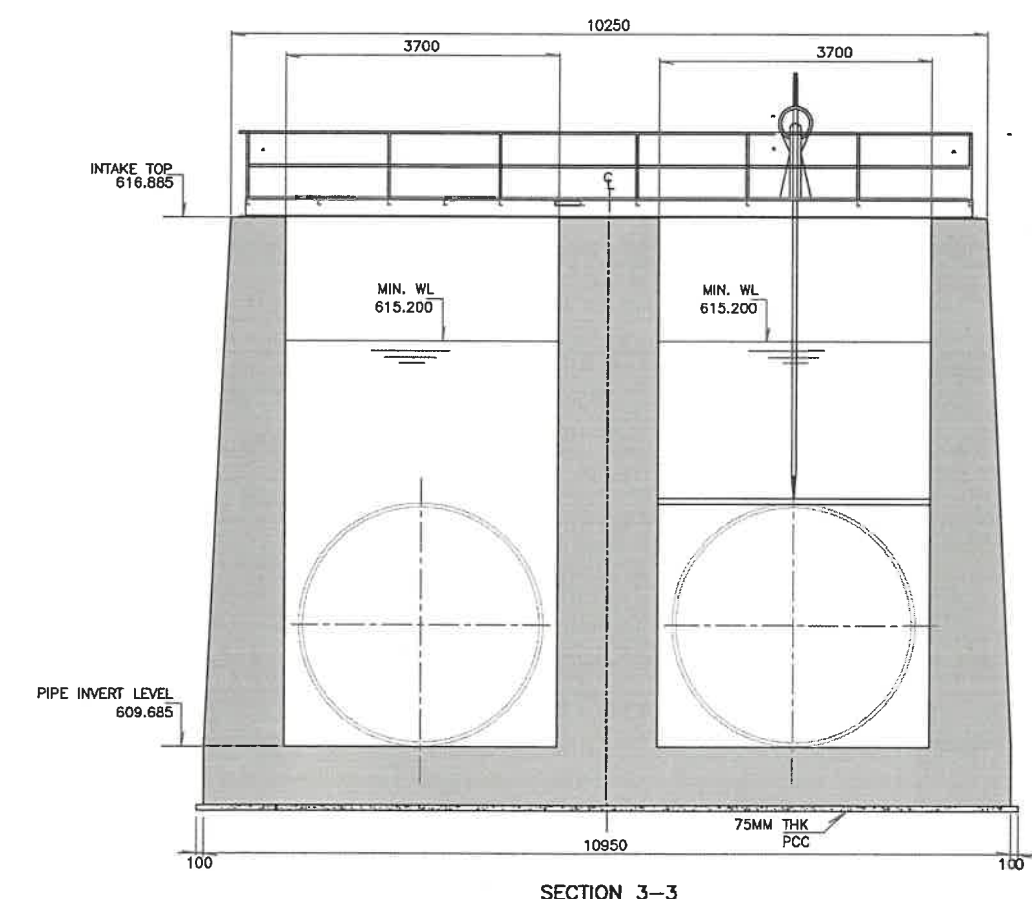
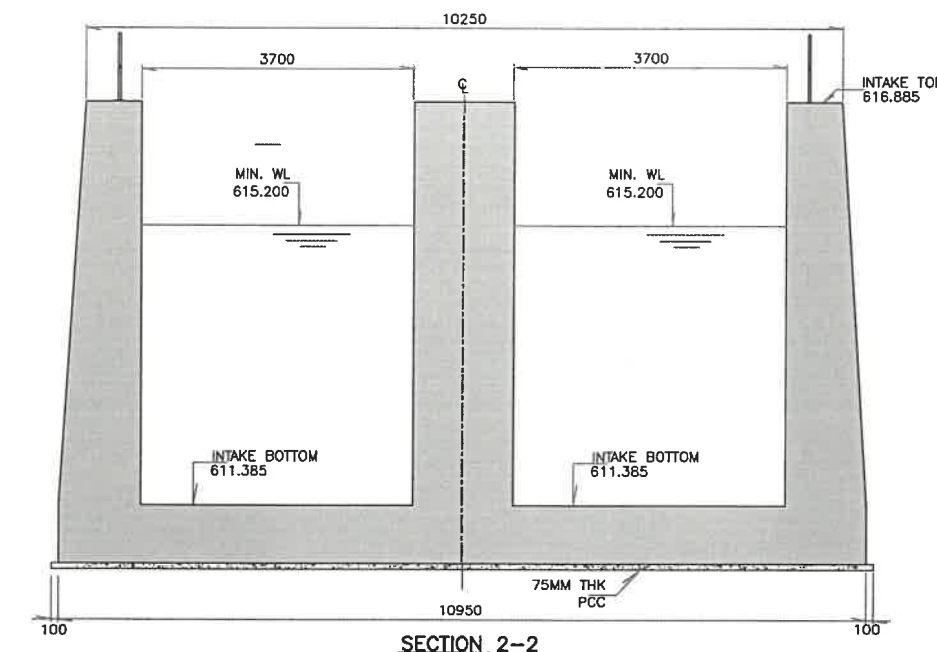
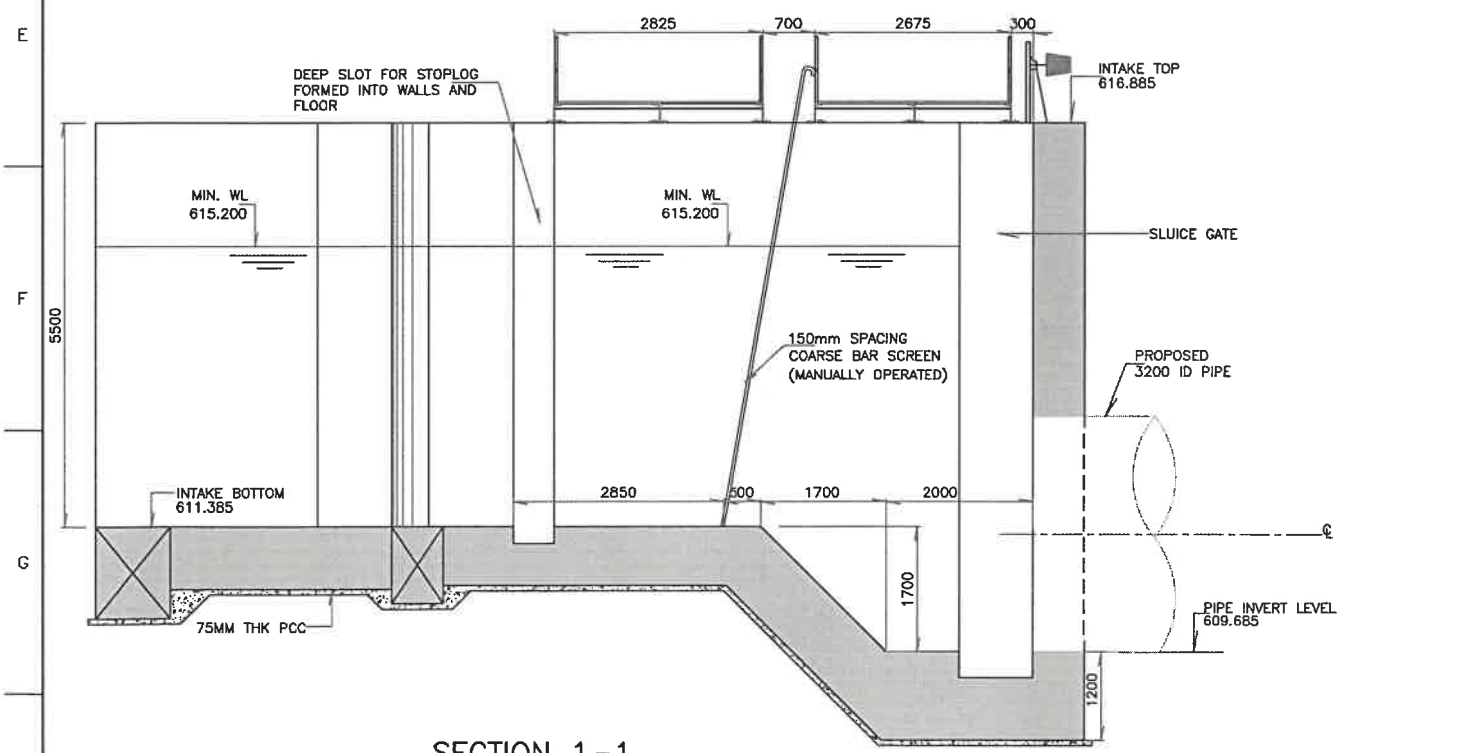
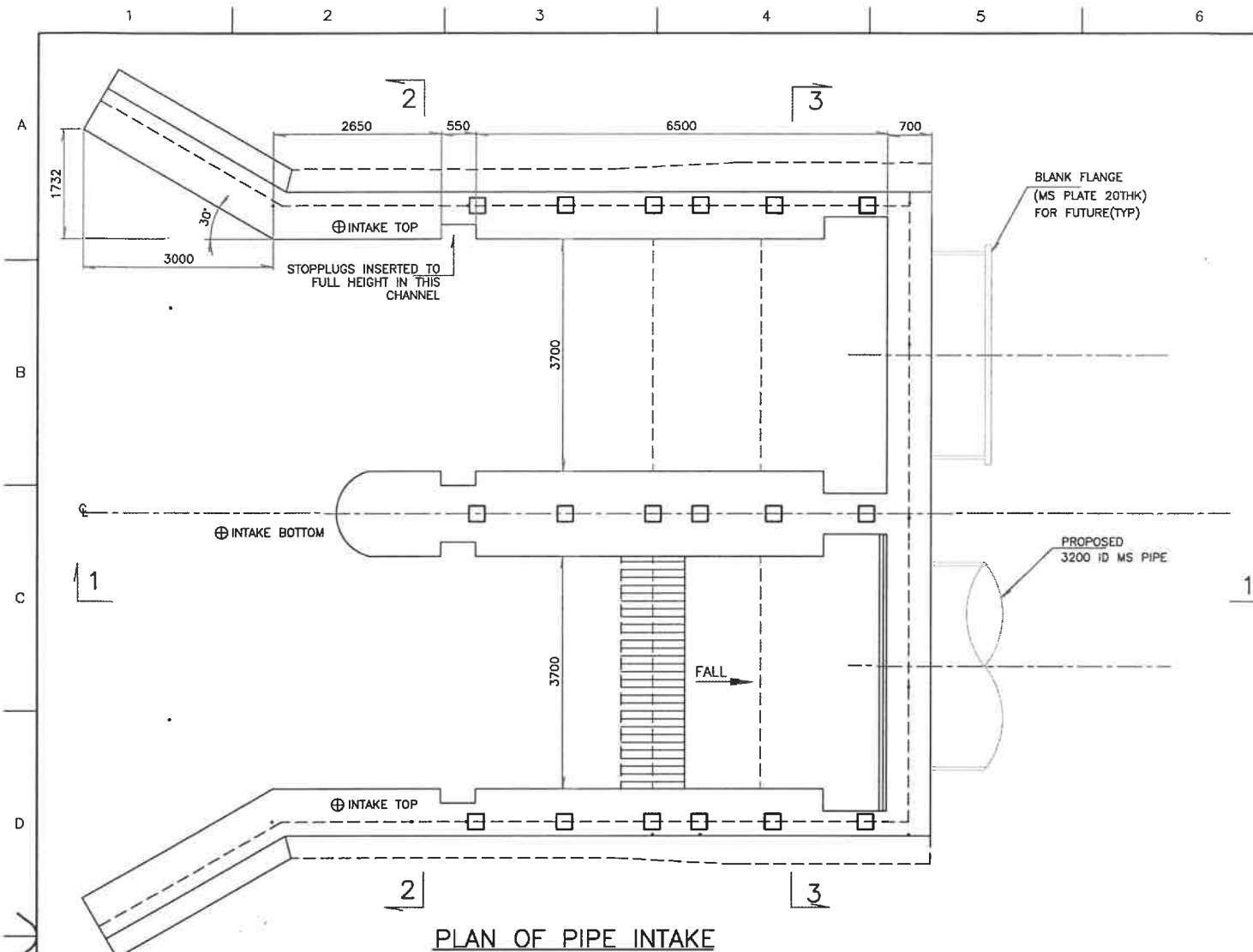


BANGALORE WATER SUPPLY
AND SEWERAGE BOARD
RAW WATER TRANSMISSION MAIN FROM
SHIVA ANICUT TO SHIVA BALANCING RESERVOIR

DETAILS OF PIPE BEDDING FOR 3200 MM ID PIPELINE

SCALE: NTS DWG. NO. EXHIBIT-4 ISSUE PO

Executive Engineer
River Operation & Maintenance-1
BWSSB thorekadanahalli
Maddur to Mandya Dist 57142



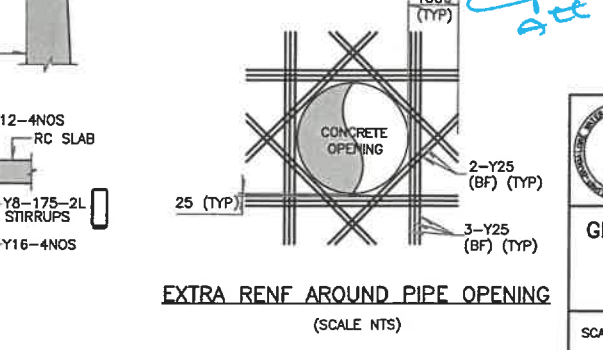
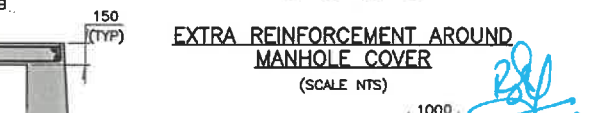
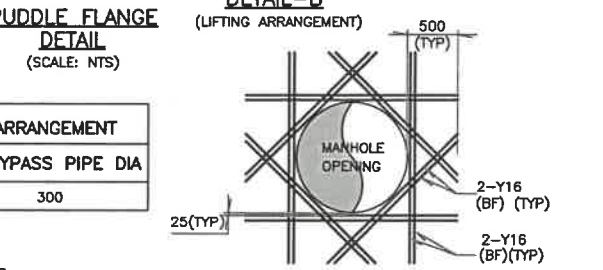
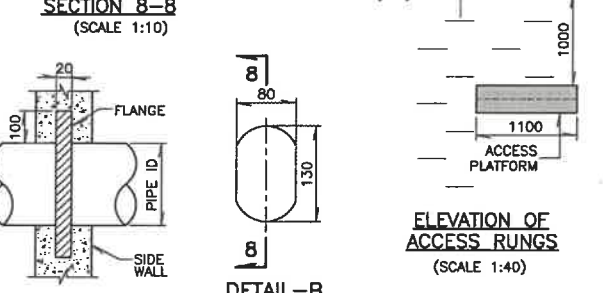
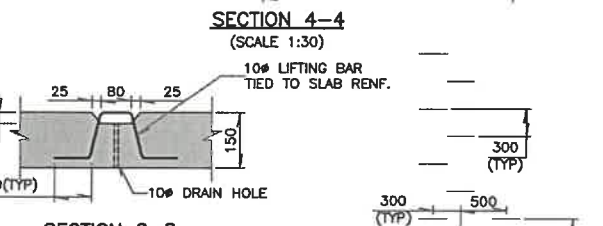
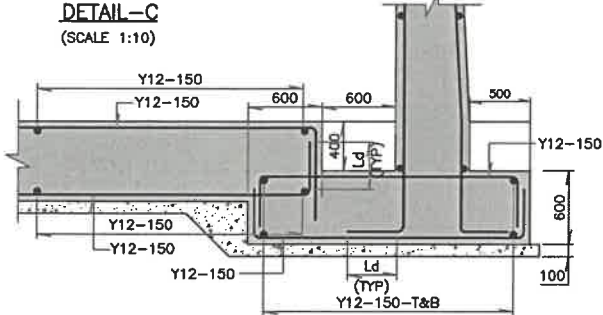
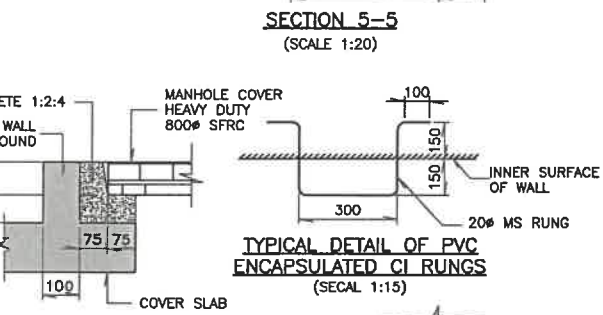
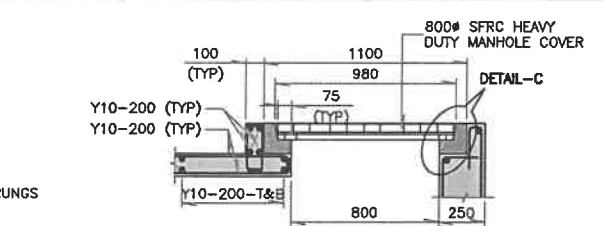
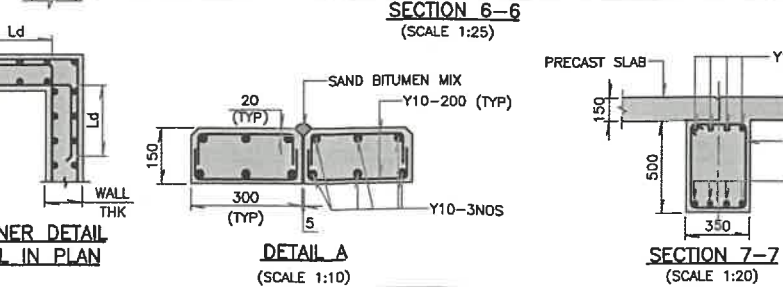
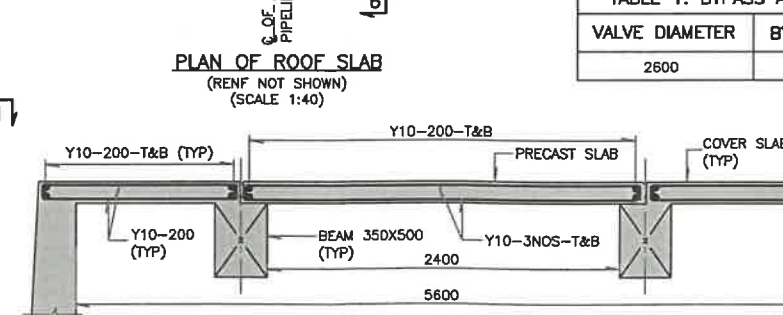
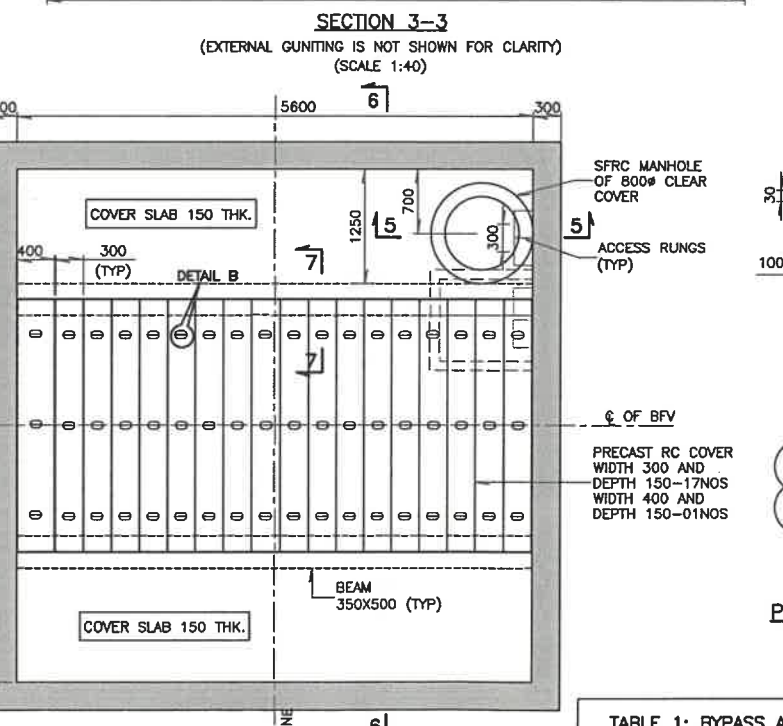
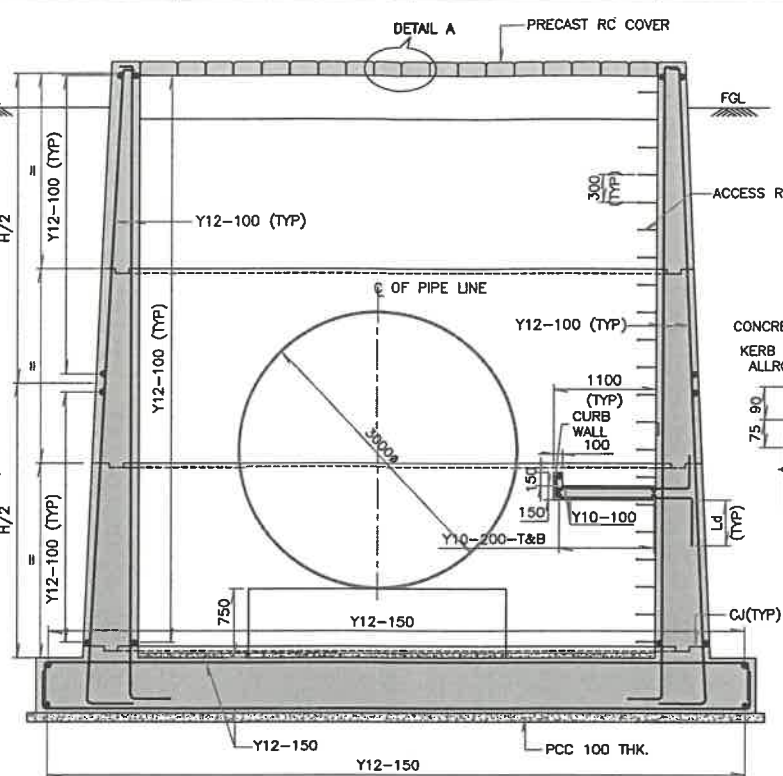
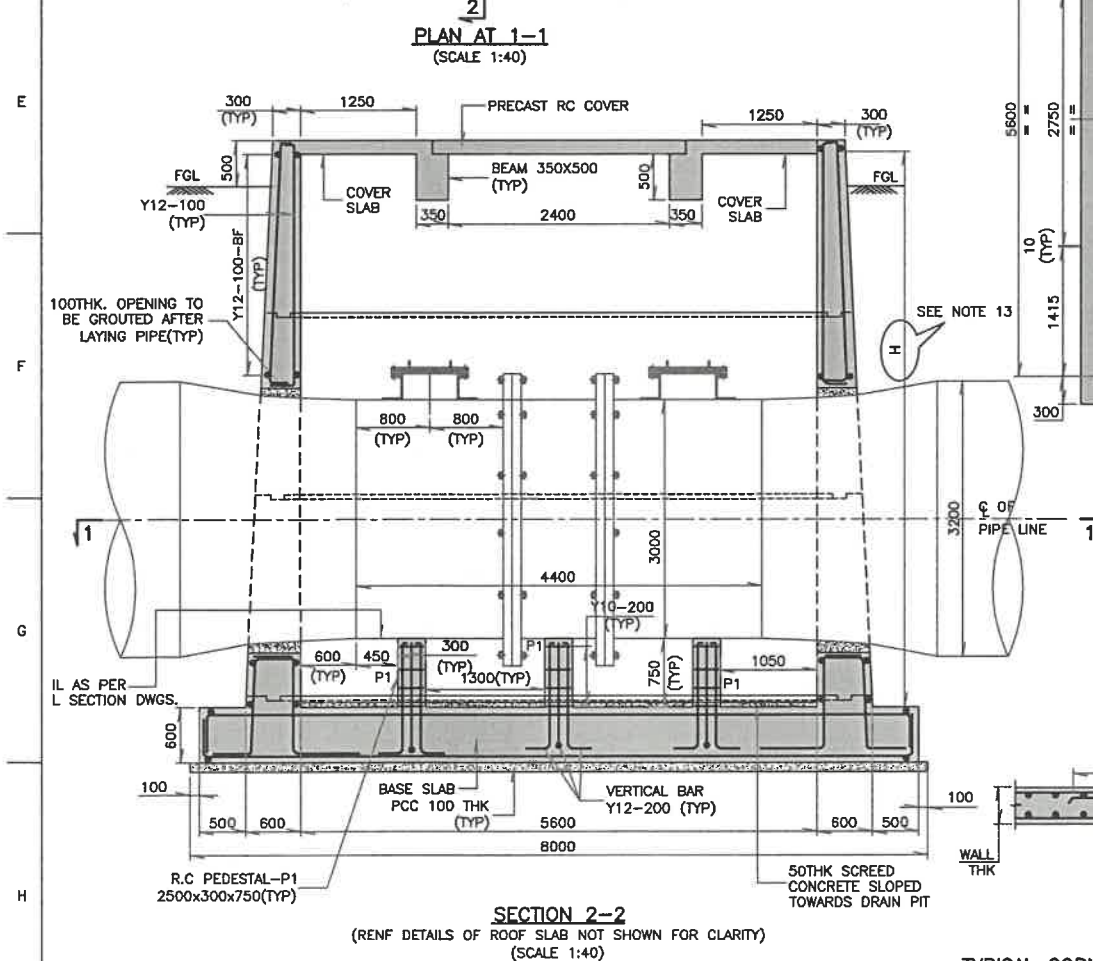
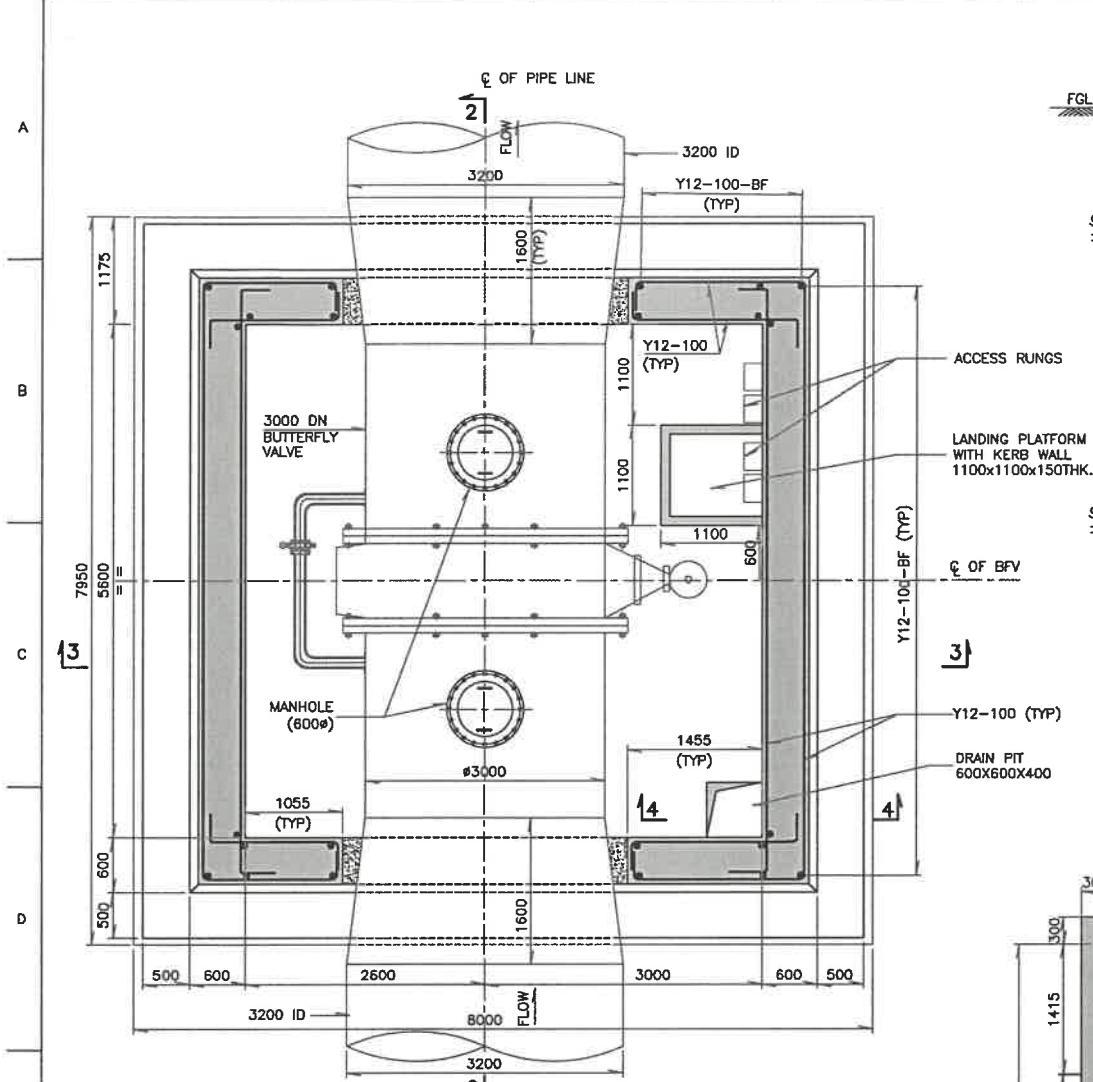
- LEGEND :**
- TYP — TYPICAL
 - CL — CENTER LINE
 - ID — INTERNAL DIAMETER
 - THK — THICK
 - M — METER
 - MM — MILLIMETER
 - MS — MILD STEEL
 - GL — GROUND LEVEL
 - WL — WATER LEVEL
 - PCC — PLAIN CEMENT CONCRETE
 - CH — CHAINAGE
 - DIA — DIAMETER

NOTES :

1. ALL DIMENSIONS ARE IN MILLIMETRES AND LEVELS IN METRES UNLESS NOTED.

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Kaveri-Operation & Maintenance 1
BWSSB Thorekadanahalli
Mahavalli Tq, Mandya Dist. 571421

		BANGALORE WATER SUPPLY AND SEWERAGE BOARD	
		RAW WATER TRANSMISSION MAIN FROM SHIVA ANICUT TO SHIVA BALANCING RESERVOIR	
GENERAL ARRANGEMENT OF PIPE INTAKE AT SHIVA ANICUT			
SCALE: NTS	DWG. NO.	EXHIBIT-3	ISSUE P0



LEGEND :

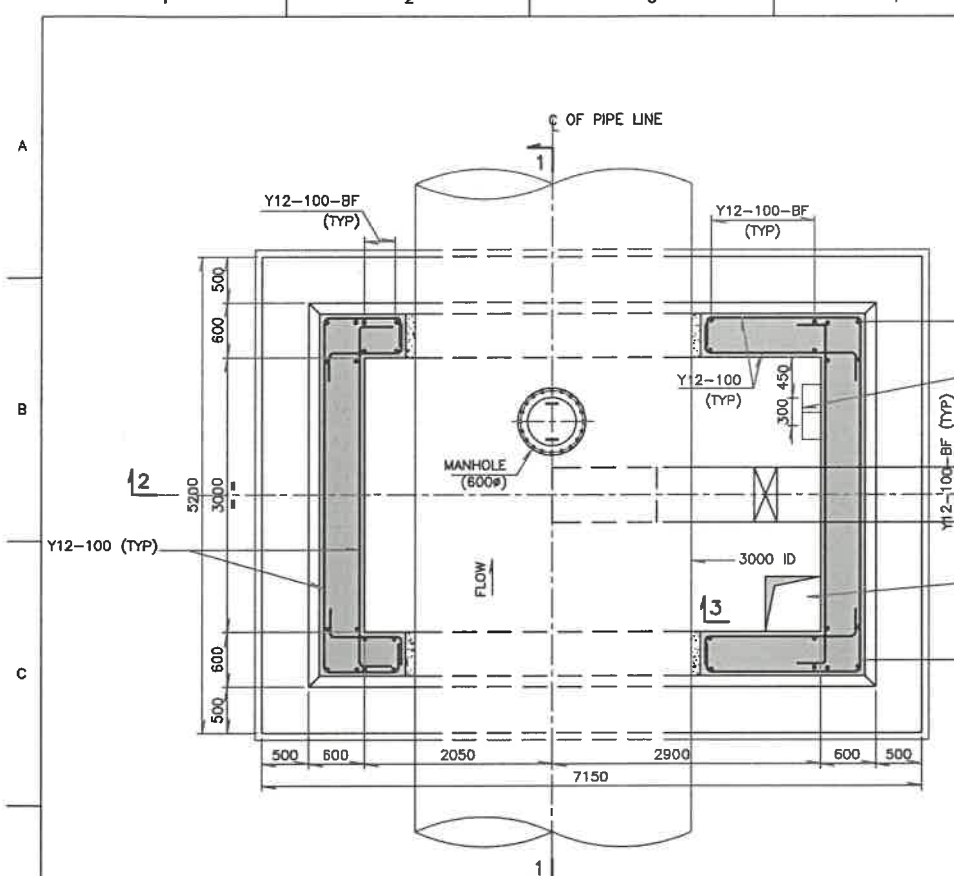
TYP —	TYPICAL	MS —	MILD STEEL
☉ —	CENTER LINE	NTS —	NOT TO SCALE
ID —	INTERNAL DIAMETER	RENF —	REINFORCEMENT
THK —	THICK	PCC —	PLAIN CEMENT CONCRETE
H —	HEIGHT	C/C —	CENTER TO CENTER
IL —	INVERT LEVEL	RC —	REINFORCED CONCRETE
B —	BOTTOM	CJ —	CONSTRUCTION JOINT
T —	TOP	DN —	NOMINAL DIAMETER
BF —	BOTH FACE	FGL —	FINISHED GROUND LEVEL
		DWG —	DRAWINGS

NOTES :

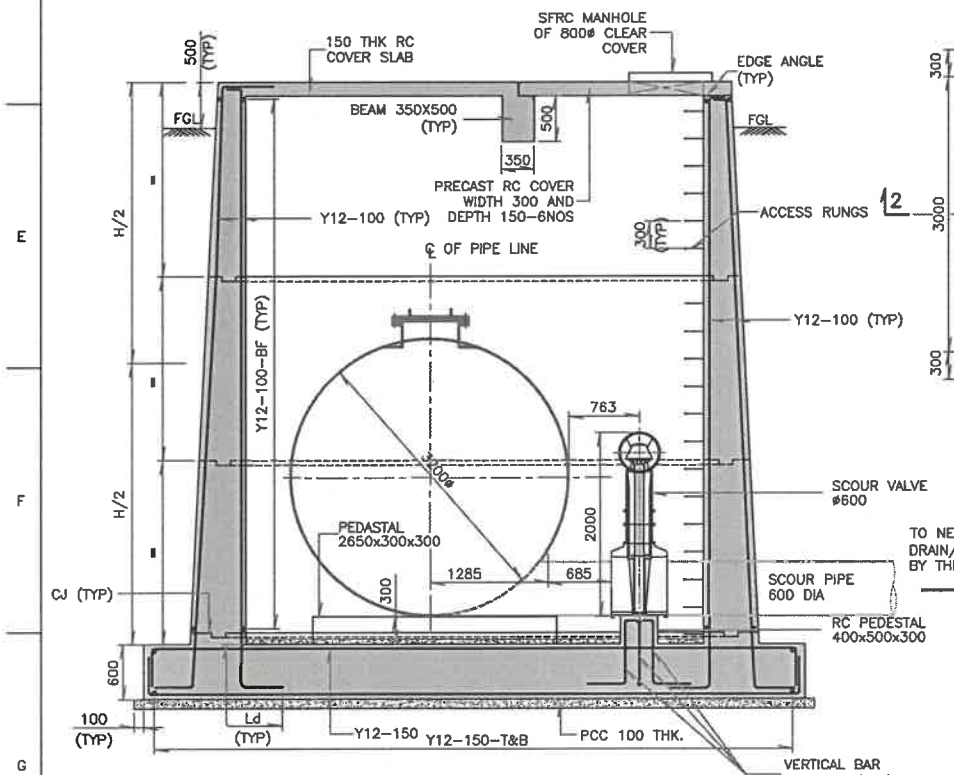
1. ALL DIMENSIONS ARE IN MILLIMETRES AND LEVELS IN METRES UNLESS NOTED.
2. GRADE OF CONCRETE SHALL BE M25 WITH MINIMUM CEMENT CONTENT WITH 20mm & DOWN SIZE AGGREGATES FOR VALVE CHAMBER AND CONFORMING TO IS 456:2000.
3. GRADE OF STEEL REINFORCEMENT SHALL BE TMT BARS OF GRADE Fe500 CONFORMING TO IS:1786.
4. PLAIN CEMENT CONCRETE UNDER FOUNDATION SHALL BE OF MIX 1:3:6 WITH MINIMUM CEMENT CONTENT WITH 40mm & DOWN SIZE AGGREGATES CONFORMING TO IS 456.
5. SAFE BEARING CAPACITY OF SOIL IS TAKEN AS 15T/Sq.m AT FOUNDING LEVEL.
6. FOOTING SHALL BE FOUNDON ON FIRM VIRGIN SOIL AT DEPTH INDICATED. IF ANY LOOSE SOIL/STRATA IS ENCOUNTERED AT FOUNDING LEVEL OR GROUND WATER TABLE IS ENCOUNTERED DURING CONSTRUCTION IT SHALL BE BROUGHT TO THE NOTICE OF THE ENGINEER FOR REDESIGNING THE SAME.
7. CLEAR COVER TO REINFORCEMENT
 - a. BASE SLAB – 50mm, b. WALLS – 45mm (SOIL FACE & FREE FACE), c. TOP COVER SLAB – 25mm, d. BEAM – 30mm,
 - e. PEDESTAL – 50mm (ALL FACES).
8. DEVELOPMENT LENGTH, LAP LENGTH & ANCHORAGE LENGTH SHALL BE 50 X DIAMETER OF SMALLER BAR.

Executive Engineer
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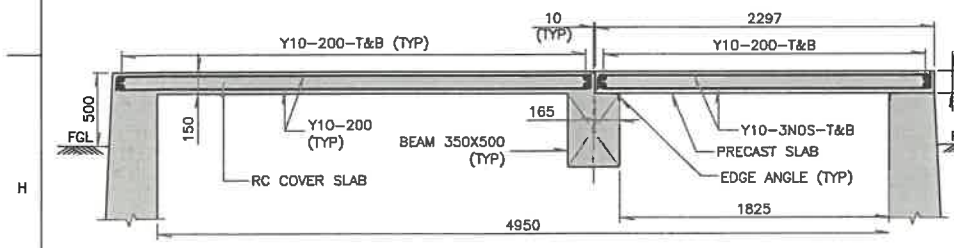
	BANGALORE WATER SUPPLY AND SEWERAGE BOARD		
	RAW WATER TRANSMISSION MAIN FROM SHIVA ANICUT TO SHIVA BALANCING RESERVOIR		
GENERAL ARRANGEMENT AND RC DETAILS OF BUTTERFLY VALVE CHAMBER FOR 3200 MM ID PIPE			
SCALE: AS SHOWN	DWG. NO.	EXHIBIT-6	ISSUE P0



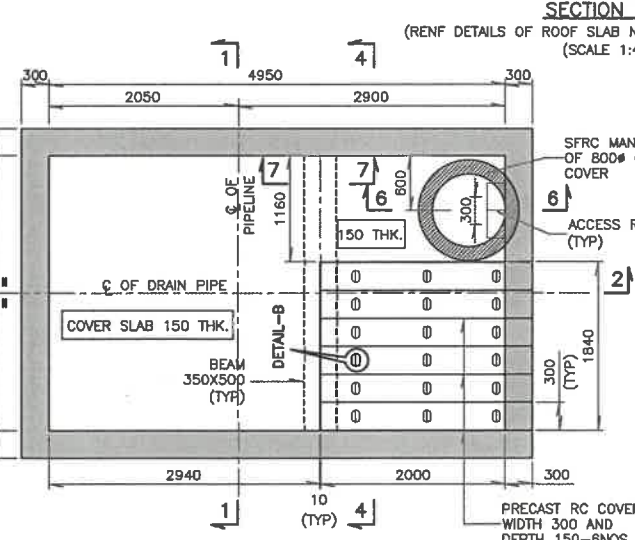
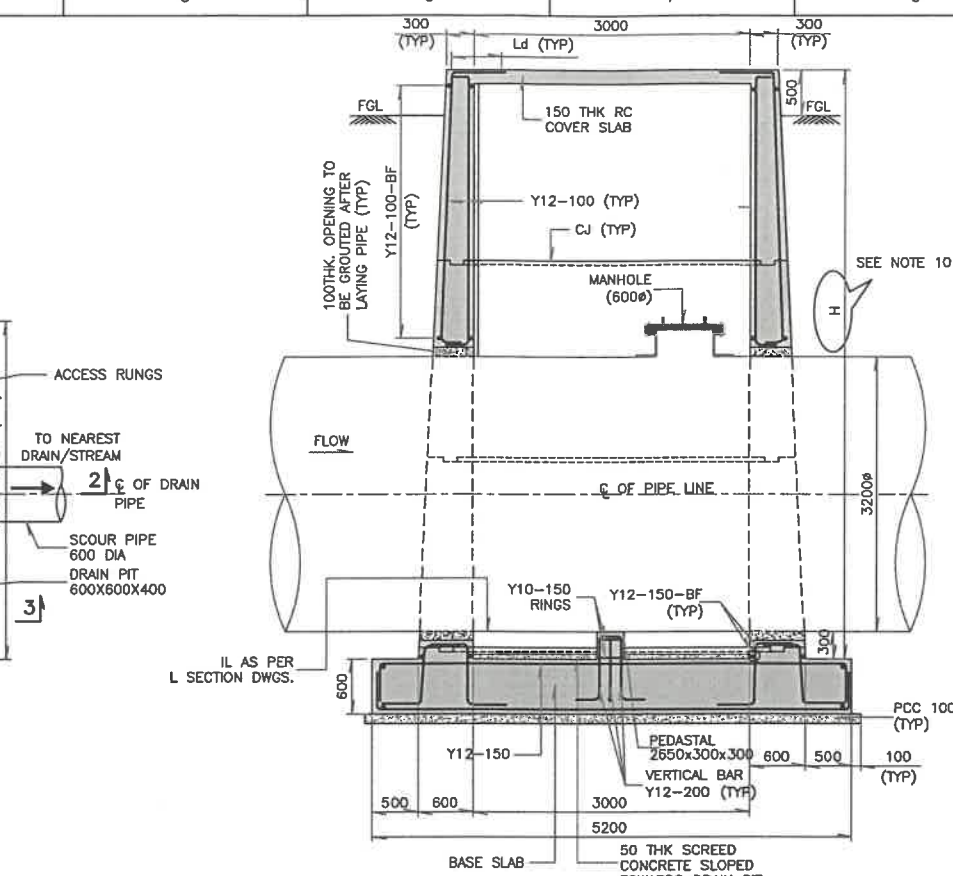
PLAN AT PIPE CROWN LEVEL
(SCALE 1:40)



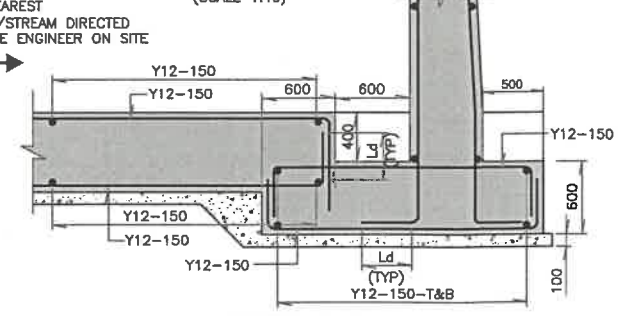
SECTION 2-2
(EXTERNAL GUNTING AND REINFORCEMENT DETAILS OF ROOF SLAB NOT SHOWN FOR CLARITY)
(SCALE 1:40)



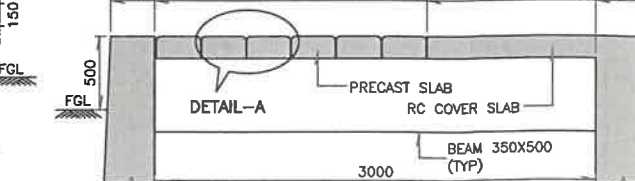
SECTION 2-2
(RC DETAILS OF TOP OF SLAB)
(SCALE 1:25)



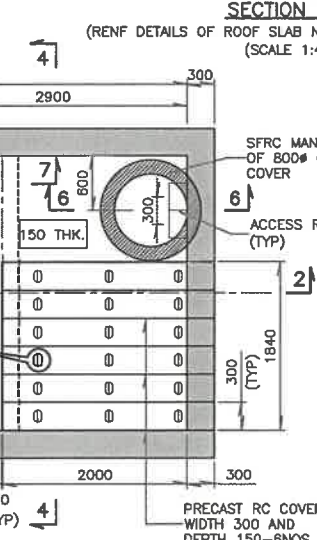
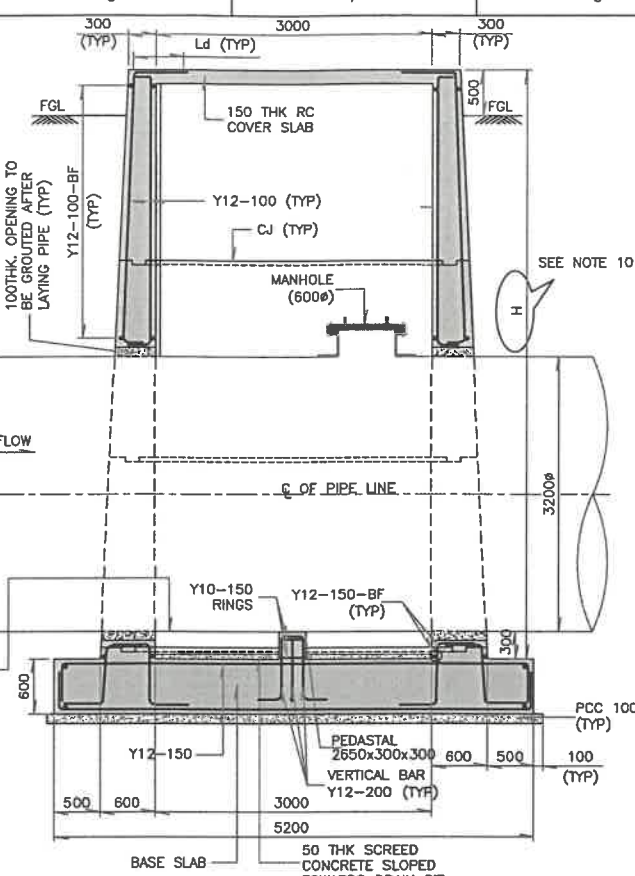
PLAN OF ROOF SLAB
(REIN NOT SHOWN)
(SCALE 1:40)



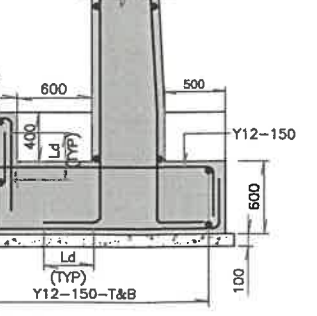
SECTION 3-3
(SCALE 1:30)



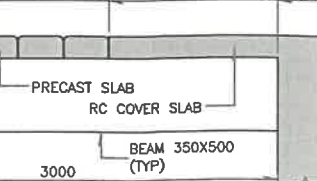
SECTION 4-4
(SCALE 1:25)



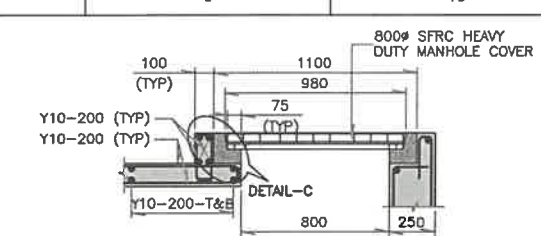
PLAN OF ROOF SLAB
(REIN NOT SHOWN)
(SCALE 1:40)



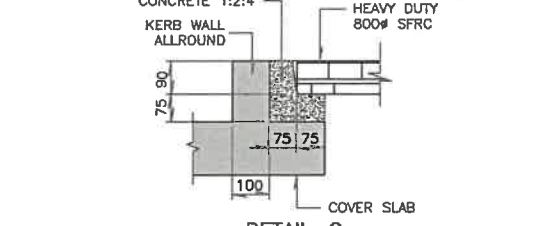
SECTION 3-3
(SCALE 1:30)



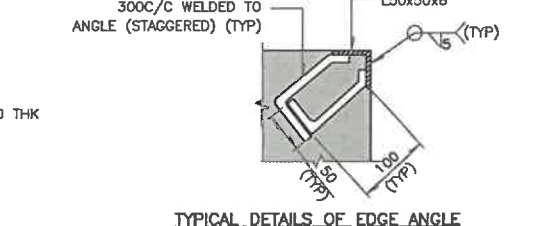
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(SCALE 1:25)



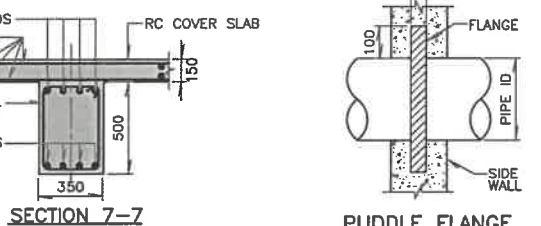
SECTION 6-6
(SCALE 1:20)



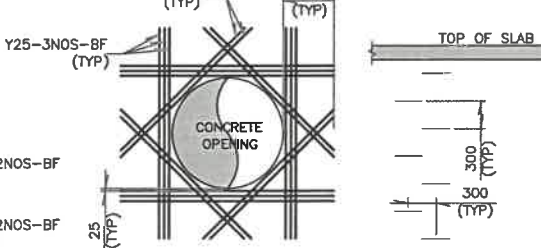
DETAIL-C
(SCALE 1:10)



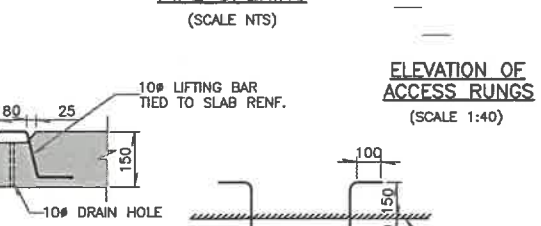
TYPICAL DETAILS OF EDGE ANGLE
(SCALE 1:05)



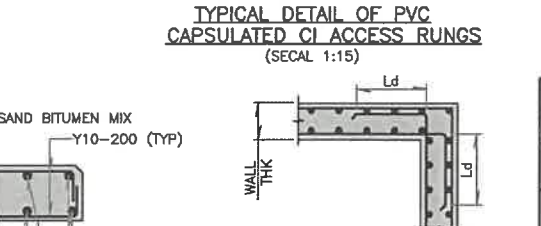
SECTION 7-7
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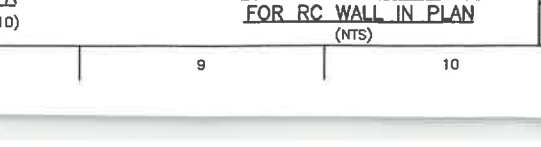
PUDDLE FLANGE DETAIL
(SCALE: NTS)



EXTRA REINFORCEMENT AROUND MANHOLE COVER
(SCALE NTS)



EXTRA RENF AROUND PIPE OPENING
(SCALE NTS)



ELEVATION OF ACCESS RUNGS
(SCALE 1:40)

TYPICAL DETAIL OF PVC CAPSULATED CI ACCESS RUNGS
(SCALE 1:15)

TYPICAL CORNER DETAIL FOR RC WALL IN PLAN
(NTS)

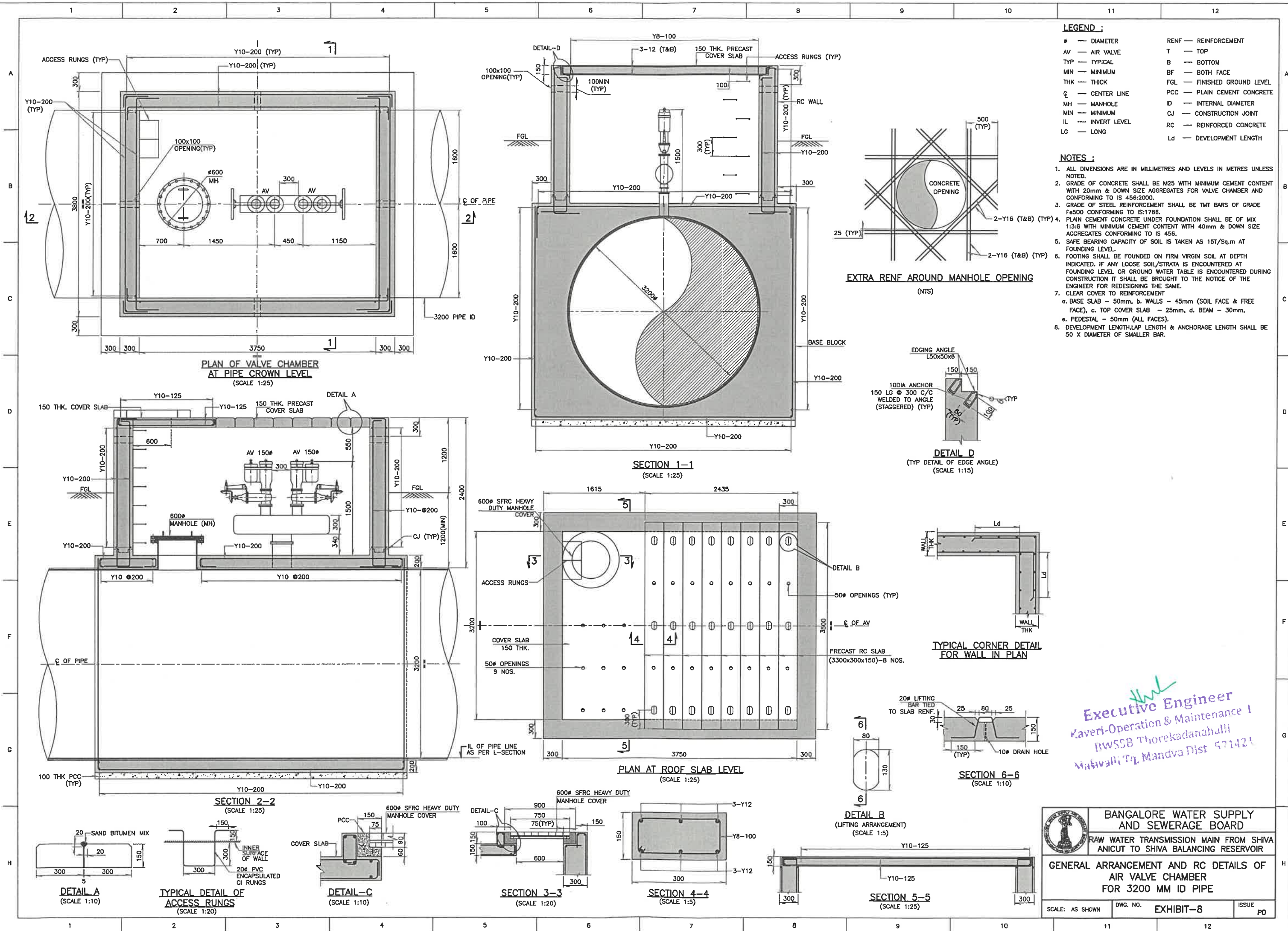
LEGEND :

TYP - TYPICAL	MS - MILD STEEL
CL - CENTER LINE	NTS - NOT TO SCALE
ID - INTERNAL DIAMETER	RENF - REINFORCEMENT
THK - THICK	PCC - PLAIN CEMENT CONCRETE
H - HEIGHT	C/C - CENTER TO CENTER
IL - INVERT LEVEL	RC - REINFORCED CONCRETE
B - BOTTOM	CJ - CONSTRUCTION JOINT
T - TOP	DN - NOMINAL DIAMETER
BF - BOTH FACE	FGL - FINISHED GROUND LEVEL
	DWGS - DRAWINGS

- NOTES :**
- ALL DIMENSIONS ARE IN MILLIMETRES AND LEVELS IN METRES UNLESS NOTED.
 - GRADE OF CONCRETE SHALL BE M25 WITH MINIMUM CEMENT CONTENT WITH 20mm & DOWN SIZE AGGREGATES FOR VALVE CHAMBER AND CONFORMING TO IS 456:2000.
 - GRADE OF STEEL REINFORCEMENT SHALL BE TMT BARS OF GRADE Fe500 CONFORMING TO IS:1786.
 - PLAIN CEMENT CONCRETE UNDER FOUNDATION SHALL BE OF MIX 1:3:6 WITH MINIMUM CEMENT CONTENT WITH 40mm & DOWN SIZE AGGREGATES CONFORMING TO IS 456.
 - SAFE BEARING CAPACITY OF SOIL IS TAKEN AS 15T/Sq.m AT FOUNDING LEVEL.
 - FOOTING SHALL BE FOUND ON FIRM VIRGIN SOIL AT DEPTH INDICATED. IF ANY LOOSE SOIL/STRATA IS ENCOUNTERED AT FOUNDING LEVEL OR GROUND WATER TABLE IS ENCOUNTERED DURING CONSTRUCTION IT SHALL BE BROUGHT TO THE NOTICE OF THE ENGINEER FOR REDESIGNING THE SAME.
 - CLEAR COVER TO REINFORCEMENT
 - BASE SLAB - 50mm, b. WALLS - 45mm (SOIL FACE & FREE FACE), c. TOP COVER SLAB - 25mm, d. BEAM - 30mm, e. PEDESTAL - 50mm (ALL FACES).
 - DEVELOPMENT LENGTH, LAP LENGTH & ANCHORAGE LENGTH SHALL BE 50 X DIAMETER OF SMALLER BAR.

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BANGALORE WATER SUPPLY AND SEWERAGE BOARD			
RAW WATER TRANSMISSION MAIN FROM SHIVA ANICUT TO SHIVA BALANCING RESERVOIR			
GENERAL ARRANGEMENT AND RC DETAILS OF SCOUR VALVE CHAMBER FOR 3200 MM ID PIPE			
SCALE: AS SHOWN	DWG. NO.	EXHIBIT-7	ISSUE
			PO



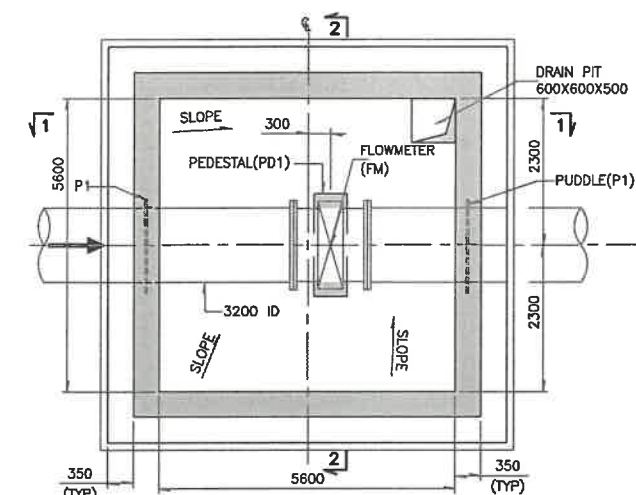
LEGEND :

Ø — DIAMETER	RENF — REINFORCEMENT
AV — AIR VALVE	T — TOP
TYP — TYPICAL	B — BOTTOM
MIN — MINIMUM	BF — BOTH FACE
THK — THICK	FGL — FINISHED GROUND LEVEL
CL — CENTER LINE	PCC — PLAIN CEMENT CONCRETE
MH — MANHOLE	ID — INTERNAL DIAMETER
MIN — MINIMUM	CJ — CONSTRUCTION JOINT
IL — INVERT LEVEL	RC — REINFORCED CONCRETE
LG — LONG	Ld — DEVELOPMENT LENGTH

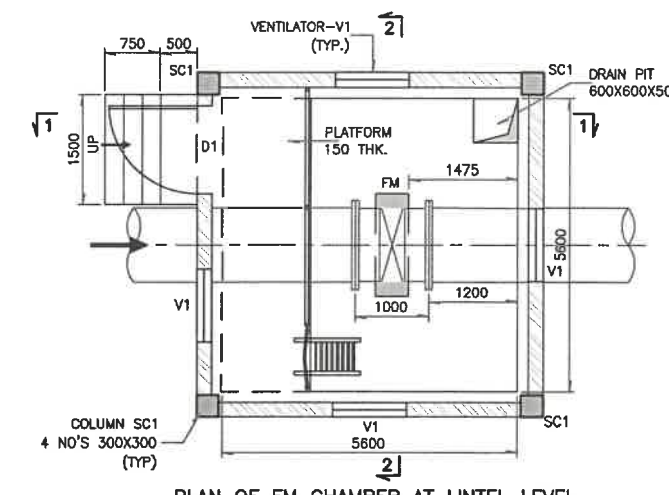
- NOTES :**
- ALL DIMENSIONS ARE IN MILLIMETRES AND LEVELS IN METRES UNLESS NOTED.
 - GRADE OF CONCRETE SHALL BE M25 WITH MINIMUM CEMENT CONTENT WITH 20mm & DOWN SIZE AGGREGATES FOR VALVE CHAMBER AND CONFORMING TO IS 456:2000.
 - GRADE OF STEEL REINFORCEMENT SHALL BE TMT BARS OF GRADE Fe500 CONFORMING TO IS:1786.
 - PLAIN CEMENT CONCRETE UNDER FOUNDATION SHALL BE OF MIX 1:3:6 WITH MINIMUM CEMENT CONTENT WITH 40mm & DOWN SIZE AGGREGATES CONFORMING TO IS 456.
 - SAFE BEARING CAPACITY OF SOIL IS TAKEN AS 15T/Sq.m AT FOUNDING LEVEL.
 - FOOTING SHALL BE FOUNDED ON FIRM VIRGIN SOIL AT DEPTH INDICATED. IF ANY LOOSE SOIL/STRATA IS ENCOUNTERED AT FOUNDING LEVEL OR GROUND WATER TABLE IS ENCOUNTERED DURING CONSTRUCTION IT SHALL BE BROUGHT TO THE NOTICE OF THE ENGINEER FOR REDESIGNING THE SAME.
 - CLEAR COVER TO REINFORCEMENT
 - a. BASE SLAB — 50mm, b. WALLS — 45mm (SOIL FACE & FREE FACE), c. TOP COVER SLAB — 25mm, d. BEAM — 30mm, e. PEDESTAL — 50mm (ALL FACES).
 - DEVELOPMENT LENGTH, LAP LENGTH & ANCHORAGE LENGTH SHALL BE 50 X DIAMETER OF SMALLER BAR.

Executive Engineer
Kaveri-Operation & Maintenance 1
RWSSB Thorekadanahalli
Maddur Tal. Mandya Dist 571421

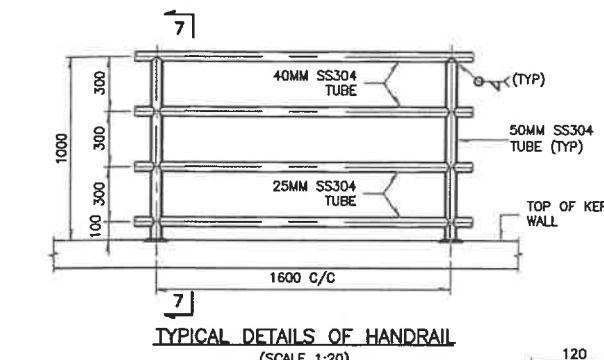
	BANGALORE WATER SUPPLY AND SEWERAGE BOARD	
	RAW WATER TRANSMISSION MAIN FROM SHIVA ANICUT TO SHIVA BALANCING RESERVOIR	
	GENERAL ARRANGEMENT AND RC DETAILS OF AIR VALVE CHAMBER FOR 3200 MM ID PIPE	
SCALE: AS SHOWN	DWG. NO. EXHIBIT-8	ISSUE P0



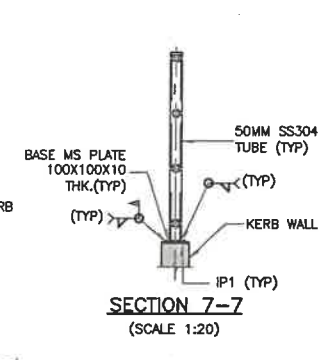
PLAN OF FLOWMETER(FM) CHAMBER ARRANGEMENT (SCALE 1:50)



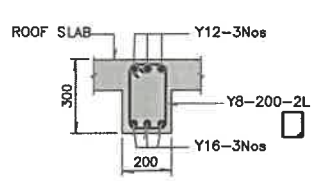
PLAN OF FM CHAMBER AT LINTEL LEVEL (SCALE 1:50)



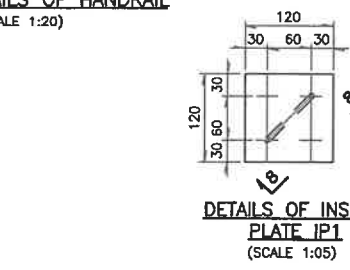
TYPICAL DETAILS OF HANDRAIL (SCALE 1:20)



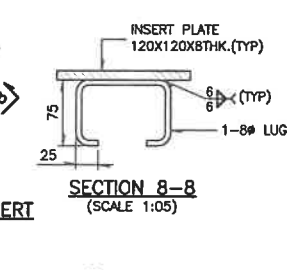
SECTION 7-7 (SCALE 1:20)



TYP. RC DETAILS OF BEAM RB-1 (200X300) (SCALE 1:15)

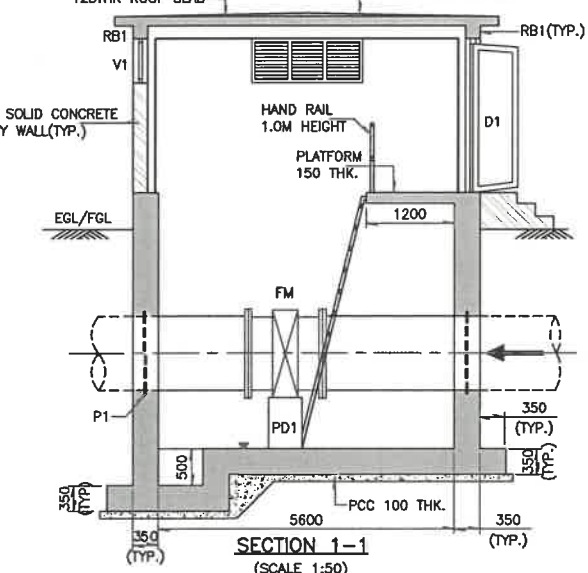


DETAILS OF INSERT PLATE IP1 (SCALE 1:05)

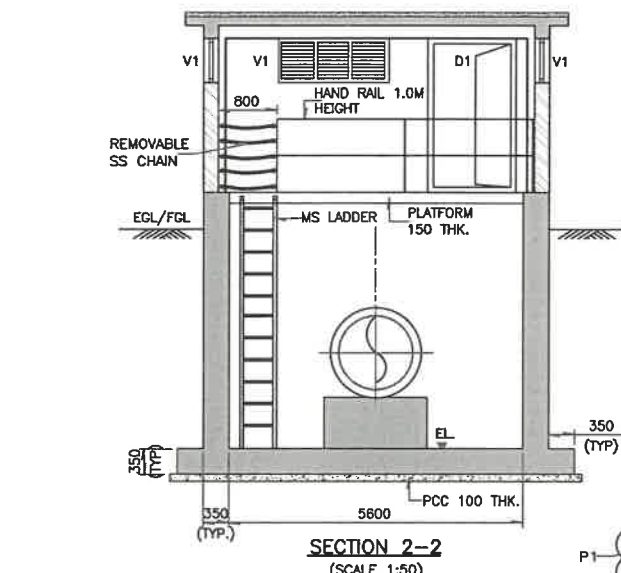


SECTION 8-8 (SCALE 1:05)

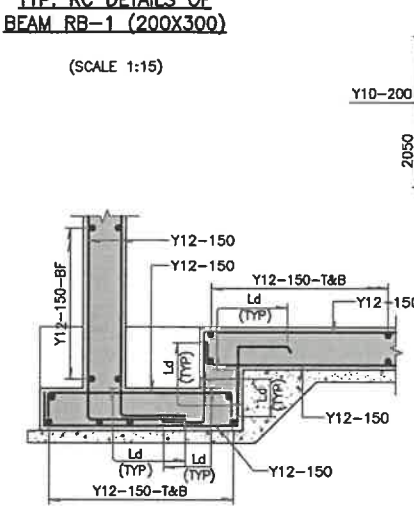
- LEGEND :**
- | | | | |
|-----|------------------------|------|-------------------------|
| TYP | — TYPICAL | BW | — BOTH WAYS |
| CL | — CENTER LINE | PL | — PLATE |
| THK | — THICK | RENF | — REINFORCEMENT |
| BFV | — BUTTERFLY VALVE | PCC | — PLAIN CEMENT CONCRETE |
| B | — BOTTOM | C/C | — CENTER TO CENTER |
| T | — TOP | RC | — REINFORCED CONCRETE |
| BF | — BOTHFACE | Ld | — DEVELOPMENT LENGTH |
| FM | — FLOWMETER | L | — LEGGED |
| WPC | — WATER PROOF COMPOUND | SC | — STUB COLUMN |
- NOTES :**
- ALL DIMENSIONS ARE IN MILLIMETRES AND LEVELS IN METRES UNLESS NOTED.
 - GRADE OF CONCRETE SHALL BE M25 WITH MINIMUM CEMENT CONTENT WITH 20mm & DOWN SIZE AGGREGATES FOR VALVE CHAMBER AND CONFORMING TO IS 456:2000.
 - GRADE OF STEEL REINFORCEMENT SHALL BE TMT BARS OF GRADE Fe500 CONFORMING TO IS:1786.
 - PLAIN CEMENT CONCRETE UNDER FOUNDATION SHALL BE OF MIX 1:3:6 WITH MINIMUM CEMENT CONTENT WITH 40mm & DOWN SIZE AGGREGATES CONFORMING TO IS 456.
 - SAFE BEARING CAPACITY OF SOIL IS TAKEN AS 15T/Sq.m AT FOUNDING LEVEL.
 - FOOTING SHALL BE FOUND ON FIRM VIRGIN SOIL AT DEPTH INDICATED. IF ANY LOOSE SOIL/STRATA IS ENCOUNTERED AT FOUNDING LEVEL OR GROUND WATER TABLE IS ENCOUNTERED DURING CONSTRUCTION IT SHALL BE BROUGHT TO THE NOTICE OF THE ENGINEER FOR REDESIGNING THE SAME.
 - CLEAR COVER TO REINFORCEMENT
a. BASE SLAB - 50mm, b. WALLS - 45mm (SOIL FACE & FREE FACE),
c. TOP COVER SLAB - 25mm, d. BEAM - 30mm,
e. PEDESTAL - 50mm (ALL FACES).
 - DEVELOPMENT LENGTH, LAP LENGTH & ANCHORAGE LENGTH SHALL BE 50 X DIAMETER OF SMALLER BAR.



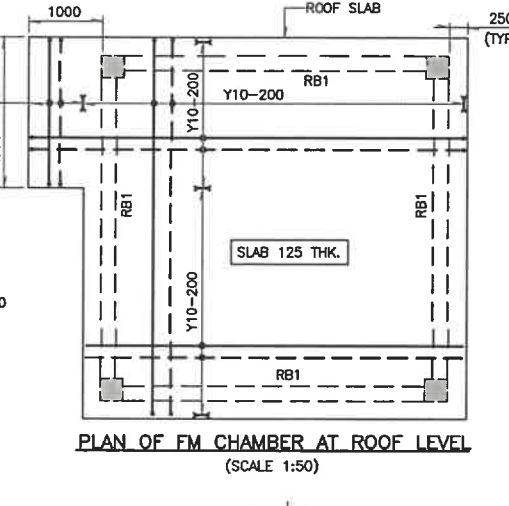
SECTION 1-1 (SCALE 1:50)



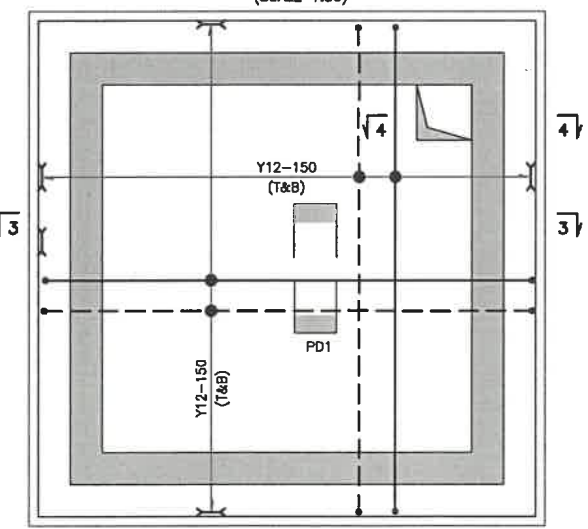
SECTION 2-2 (SCALE 1:50)



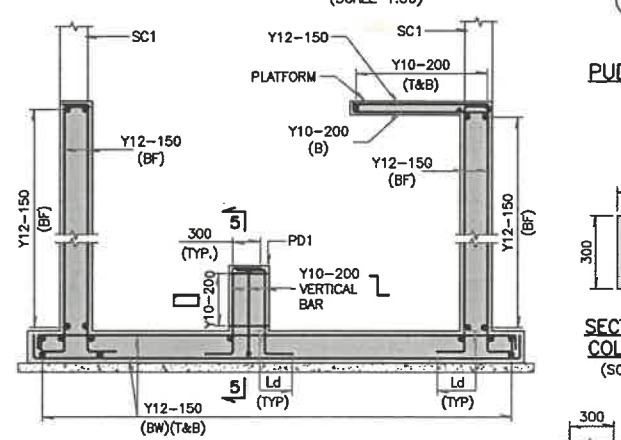
SECTION 4-4 RC DETAILS OF DRAIN PIT AT FM VALVE CHAMBER (SCALE 1:30)



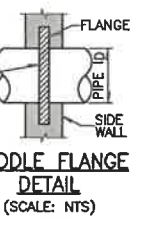
PLAN OF FM CHAMBER AT ROOF LEVEL (SCALE 1:50)



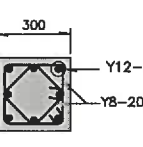
RC DETAILS OF BASE SLAB FOR BFV CHAMBER (SCALE 1:40)



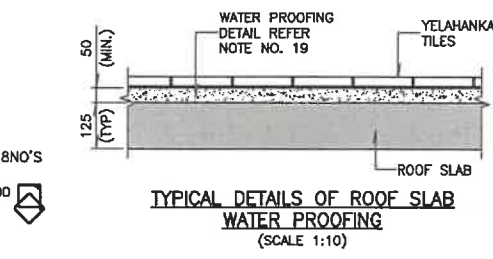
SECTION 3-3 (SCALE 1:40)



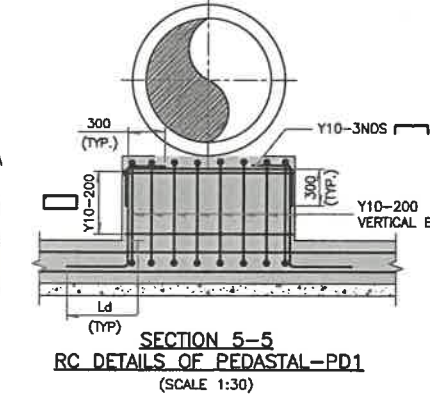
PUDDLE FLANGE DETAIL (SCALE: NTS)



SECTION 6-6 COLUMN SC1 (SCALE 1:15)



TYPICAL DETAILS OF ROOF SLAB WATER PROOFING (SCALE 1:10)



SECTION 5-5 RC DETAILS OF PEDESTAL-PD1 (SCALE 1:30)

NOTE
SLOPE SHOULD BE PROVIDED TOWARDS DRAIN PIT IN THE BASE SLAB OF THE CHAMBER

SCHEDULE OF JOINERY

S/NO	DESCRIPTION	SIZE	REMARKS	NOS
1.	D1	1200 X 2100	STAINLESS STEEL DOOR	1
2.	V1	1200 X 600	ALUMINUM VENTILATOR	4

SCHEDULE OF FINISHES

INTERNAL WALL	EXTERNAL WALL	CEILING
ONE COAT OF PRIMER + 2 COATS OF PLASTIC EMULSION	ONE COAT OF PRIMER + 2 COATS OF PLASTIC EMULSION	ONE COAT OF PRIMER + 2 COATS OF PLASTIC EMULSION

ROOF BEAM DETAILS

SI NO.	DESCRIPTION	SIZE
1	RB1	200X300

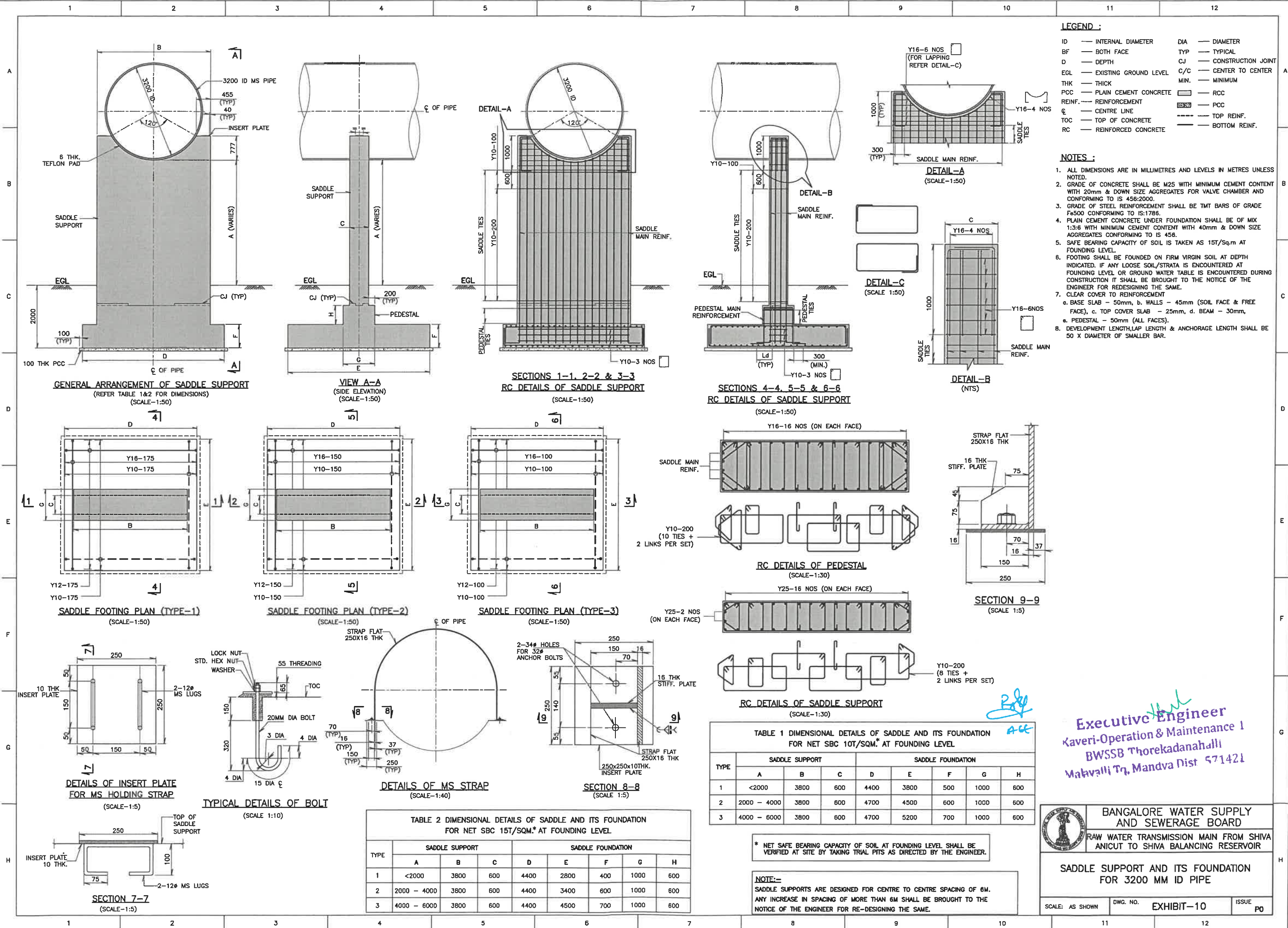


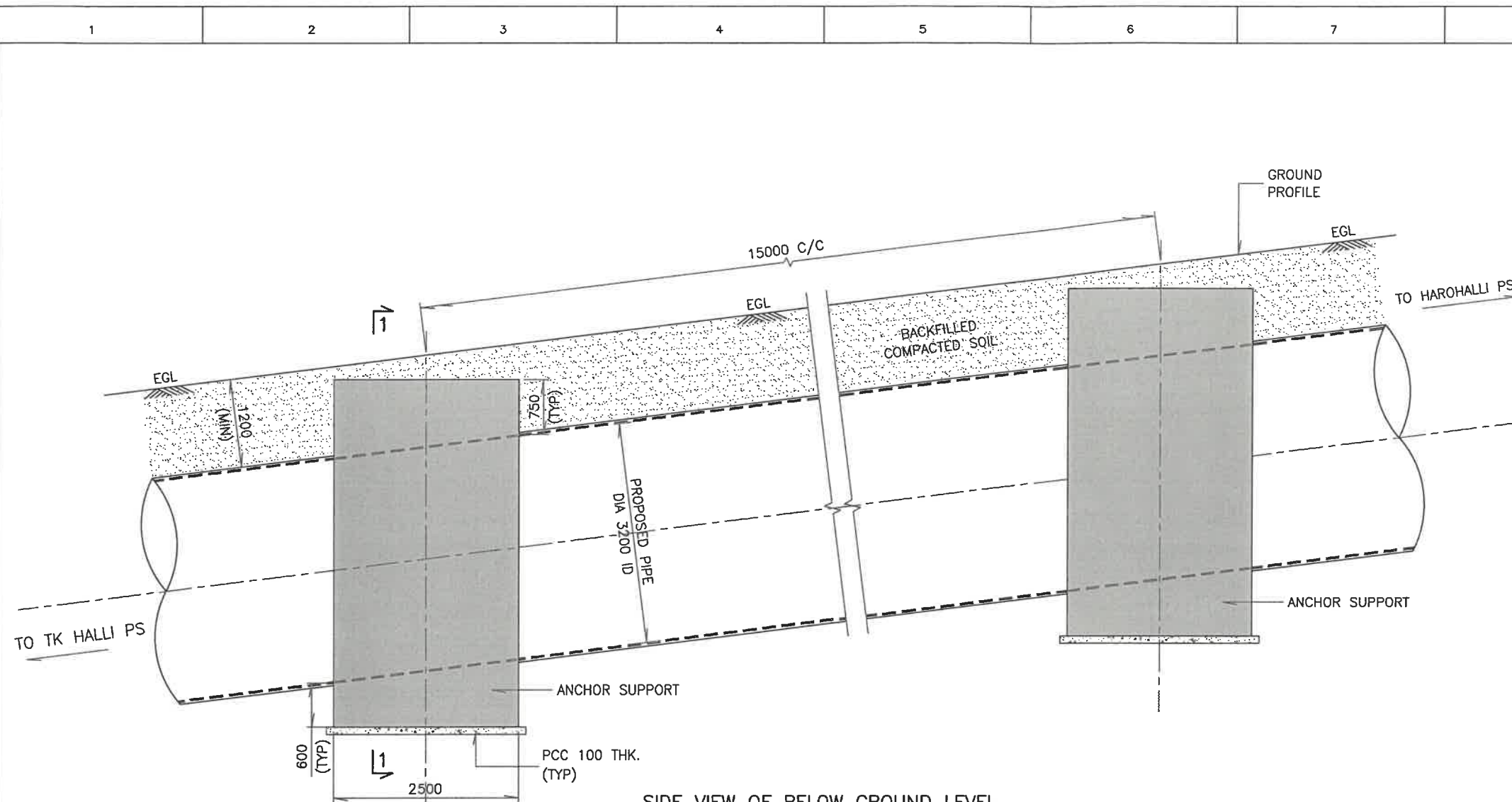
BANGALORE WATER SUPPLY AND SEWERAGE BOARD
RAW WATER TRANSMISSION MAIN FROM SHIVA ANICUT TO SHIVA BALANCING RESERVOIR

GENERAL ARRANGEMENT AND RC DETAILS OF FLOW METER VALVE CHAMBER FOR 3200 MM ID PIPE

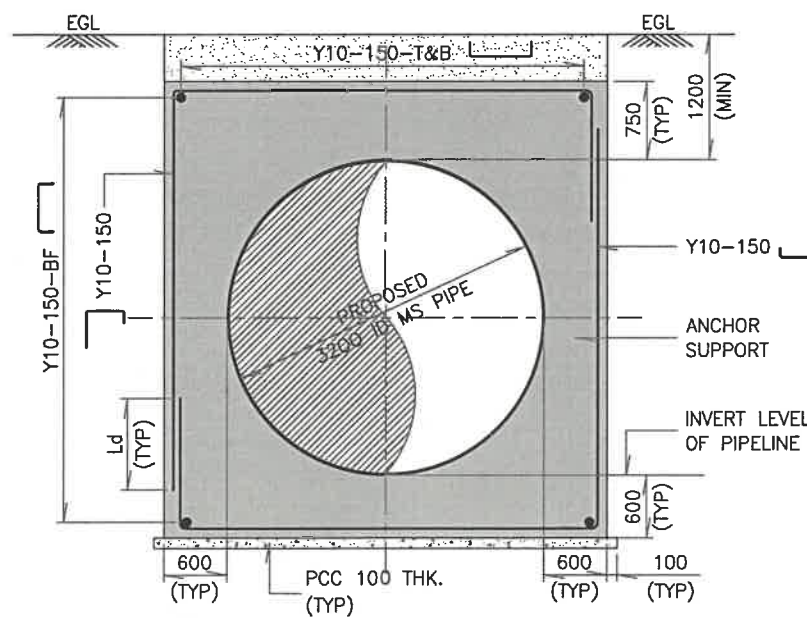
SCALE: AS SHOWN DWG. NO. **EXHIBIT-9** ISSUE **P0**

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**SIDE VIEW OF BELOW GROUND LEVEL
ANCHOR SUPPORTS AT STEEP TERRAIN**
(SCALE 1:50)



SECTION 1-1
(SCALE 1:50)

- NOTE:**
1. SPACING OF ANCHOR SUPPORTS SHOWN IN THE DRAWING IS INDICATIVE ONLY. THE ACTUAL LOCATION OF ANCHOR SUPPORTS SHALL BE AS DIRECTED BY THE ENGINEER.
 2. THIS DRAWING IS APPLICABLE ONLY AT LOCATIONS OF STEEP TERRAIN AND IN NON-WATER LOGGED AREAS.

LEGEND :

TYP - TYPICAL	PCC - PLAIN CEMENT CONCRETE
MS - MILD STEEL	EGL - EXISTING GROUND LEVEL
THK. - THICK	RCC - REINFORCED CEMENT CONCRETE
ID - INTERNAL DIAMETER	PS - PUMPING STATION
T - TOP	B - BOTTOM
MIN - MINIMUM	BF - BOTH FACE
	Ld - DEVELOPMENT LENGTH

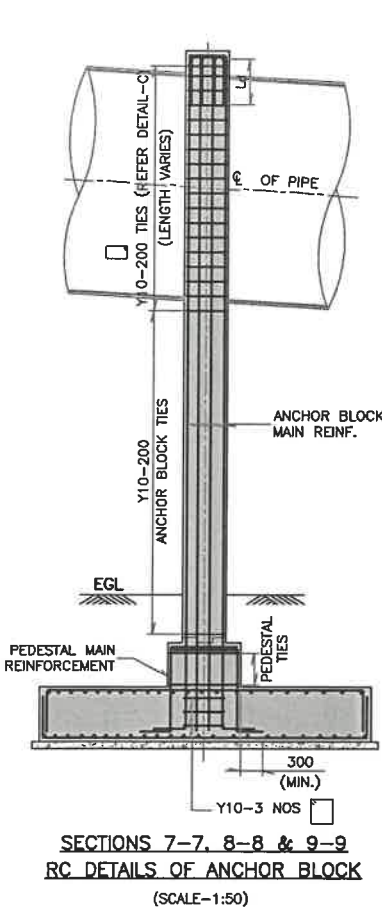
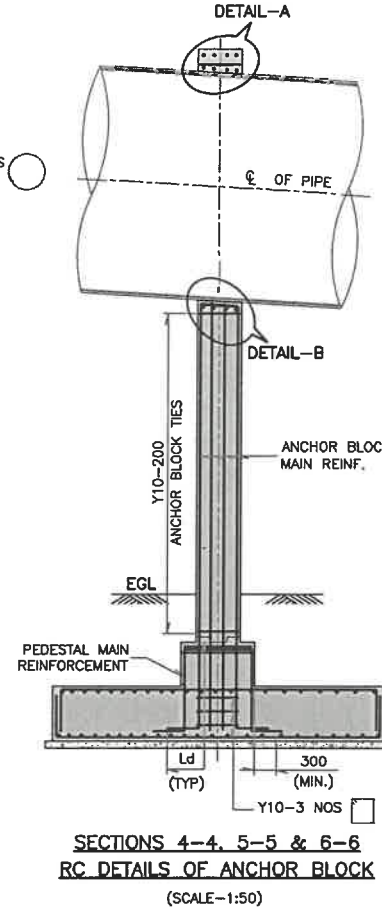
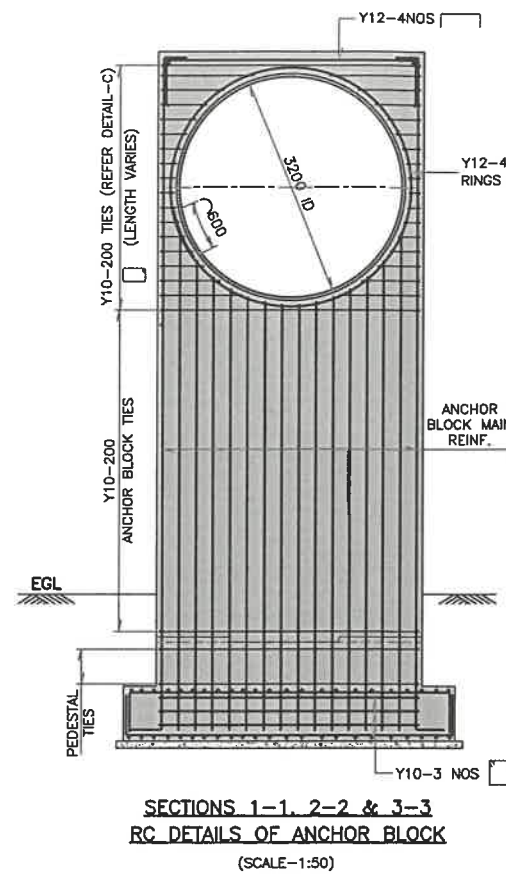
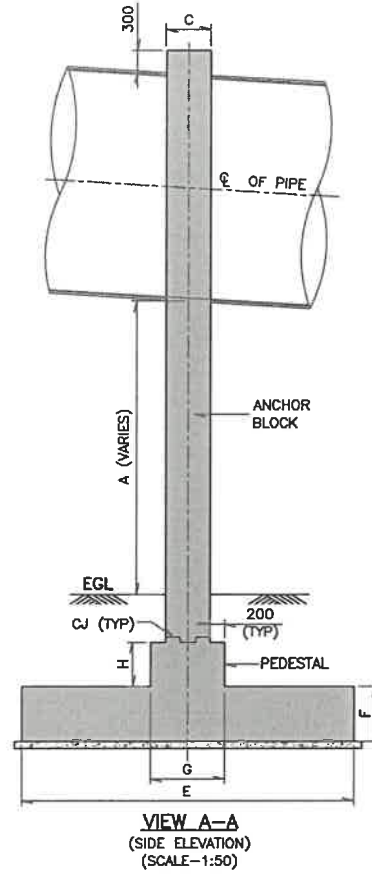
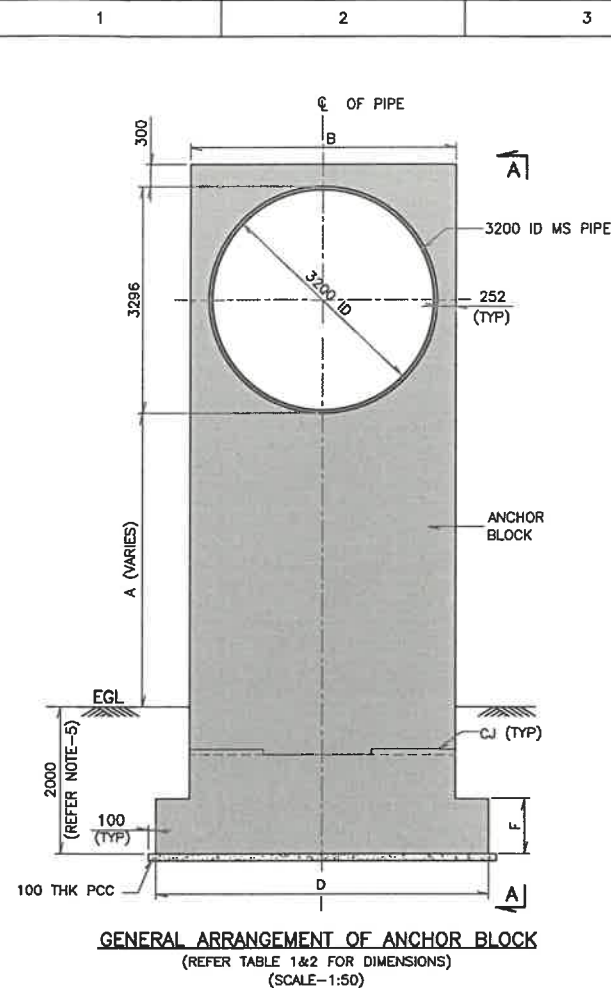
■ - RCC

- NOTES :**
1. ALL DIMENSIONS ARE IN MILLIMETRES AND LEVELS IN METRES UNLESS NOTED.
 2. GRADE OF CONCRETE SHALL BE M25 WITH MINIMUM CEMENT CONTENT WITH 20mm & DOWN SIZE AGGREGATES FOR VALVE CHAMBER AND CONFORMING TO IS 456:2000.
 3. GRADE OF STEEL REINFORCEMENT SHALL BE TMT BARS OF GRADE Fe500 CONFORMING TO IS:1786.
 4. PLAIN CEMENT CONCRETE UNDER FOUNDATION SHALL BE OF MIX 1:3:6 WITH MINIMUM CEMENT CONTENT WITH 40mm & DOWN SIZE AGGREGATES CONFORMING TO IS 456.
 5. SAFE BEARING CAPACITY OF SOIL IS TAKEN AS 15T/Sq.m AT FOUNDING LEVEL.
 6. FOOTING SHALL BE FOUNDED ON FIRM VIRGIN SOIL AT DEPTH INDICATED. IF ANY LOOSE SOIL/STRATA IS ENCOUNTERED AT FOUNDING LEVEL OR GROUND WATER TABLE IS ENCOUNTERED DURING CONSTRUCTION IT SHALL BE BROUGHT TO THE NOTICE OF THE ENGINEER FOR REDESIGNING THE SAME.
 7. CLEAR COVER TO REINFORCEMENT
a. BASE SLAB - 50mm, b. WALLS - 45mm (SOIL FACE & FREE FACE),
c. TOP COVER SLAB - 25mm, d. BEAM - 30mm,
e. PEDESTAL - 50mm (ALL FACES).
 8. DEVELOPMENT LENGTH, LAP LENGTH & ANCHORAGE LENGTH SHALL BE 50 X DIAMETER OF SMALLER BAR.

28/8/24
att

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	BANGALORE WATER SUPPLY AND SEWERAGE BOARD	
	RAW WATER TRANSMISSION MAIN FROM SHIVA ANICUT TO SHIVA BALANCING RESERVOIR	
	TYPICAL GA AND RC DETAILS OF BELOW GROUND LEVEL ANCHOR SUPPORTS AT STEEP TERRAIN	
SCALE: AS SHOWN	DWG. NO. EXHIBIT-11	ISSUE P0



LEGEND :

ID — INTERNAL DIAMETER
BF — BOTH FACE
D — DEPTH
EGL — EXISTING GROUND LEVEL
THK — THICK
PCC — PLAIN CEMENT CONCRETE
REINF. — REINFORCEMENT
CL — CENTRE LINE
DIA — DIAMETER
TDC — TOP OF CONCRETE
RC — REINFORCED CONCRETE

TYP — TYPICAL
CJ — CONSTRUCTION JOINT
C/C — CENTER TO CENTER
MIN. — MINIMUM
RCC — RCC
PCC — PCC
TOP REINF. — TOP REINF.
BOTTOM REINF. — BOTTOM REINF.

- NOTES :**
- ALL DIMENSIONS ARE IN MILLIMETRES AND LEVELS IN METRES UNLESS NOTED.
 - GRADE OF CONCRETE SHALL BE M25 WITH MINIMUM CEMENT CONTENT WITH 20mm & DOWN SIZE AGGREGATES FOR VALVE CHAMBER AND CONFORMING TO IS 456:2000.
 - GRADE OF STEEL REINFORCEMENT SHALL BE TMT BARS OF GRADE Fe500 CONFORMING TO IS:1786.
 - PLAIN CEMENT CONCRETE UNDER FOUNDATION SHALL BE OF MIX 1:3:6 WITH MINIMUM CEMENT CONTENT WITH 40mm & DOWN SIZE AGGREGATES CONFORMING TO IS 458.
 - SAFE BEARING CAPACITY OF SOIL IS TAKEN AS 15T/Sq.m AT FOUNDING LEVEL.
 - FOOTING SHALL BE FOUNDED ON FIRM VIRGIN SOIL AT DEPTH INDICATED. IF ANY LOOSE SOIL/STRATA IS ENCOUNTERED AT FOUNDING LEVEL OR GROUND WATER TABLE IS ENCOUNTERED DURING CONSTRUCTION IT SHALL BE BROUGHT TO THE NOTICE OF THE ENGINEER FOR REDESIGNING THE SAME.
 - CLEAR COVER TO REINFORCEMENT
a. BASE SLAB — 50mm, b. WALLS — 45mm (SOIL FACE & FREE FACE), c. TOP COVER SLAB — 25mm, d. BEAM — 30mm, e. PEDESTAL — 50mm (ALL FACES).
 - DEVELOPMENT LENGTH, LAP LENGTH & ANCHORAGE LENGTH SHALL BE 50 X DIAMETER OF SMALLER BAR.

NOTE:-
ANCHOR BLOCKS ARE DESIGNED FOR CENTRE TO CENTRE SPACING OF 6.0M. ANY INCREASE IN SPACING OF MORE THAN 6.0M SHALL BE BROUGHT TO THE NOTICE OF THE ENGINEER FOR RE-DESIGNING THE SAME.

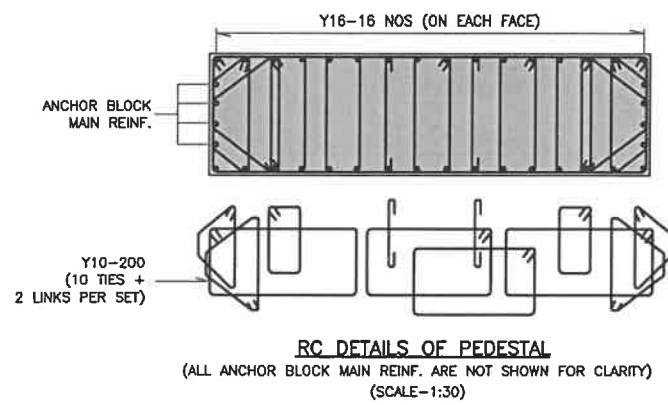
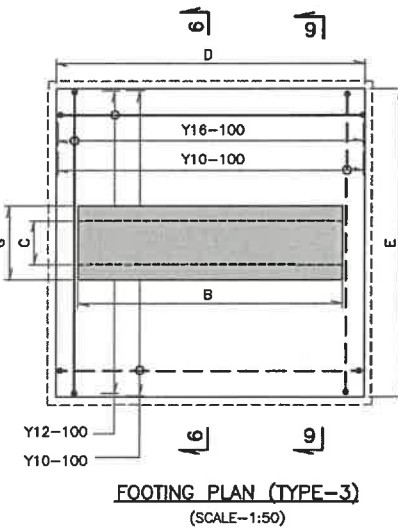
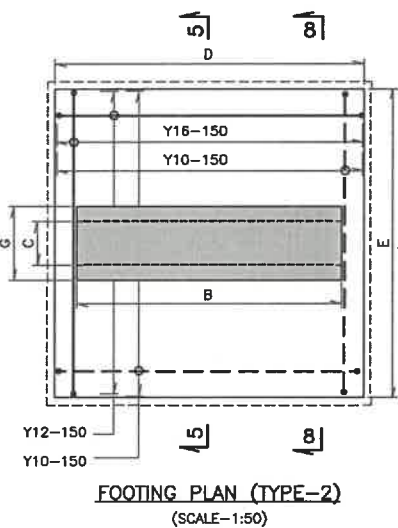
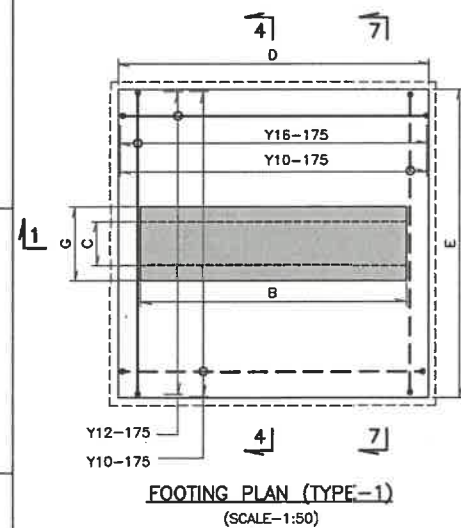


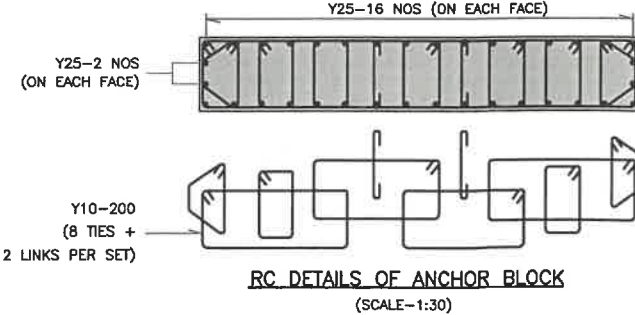
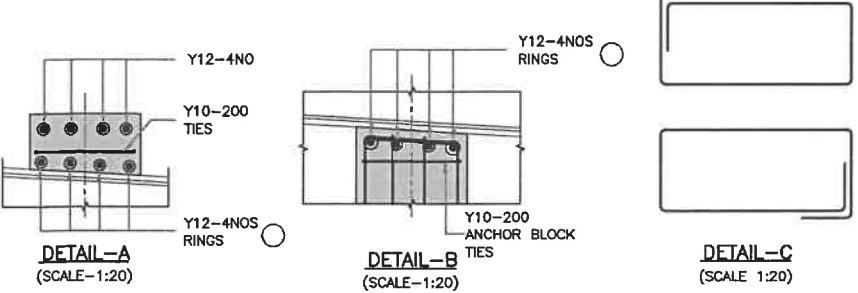
TABLE 1 DIMENSIONAL DETAILS OF ANCHOR BLOCK AND ITS FOUNDATION FOR NET SBC 10T/SQM.* AT FOUNDING LEVEL

TYPE	ANCHOR BLOCK				ANCHOR BLOCK FOUNDATION			
	A	B	C	D	E	F	G	H
1	<2000	3800	600	4400	3800	500	1000	600
2	2000 — 4000	3800	600	4700	4500	600	1000	600
3	4000 — 6000	3800	600	4700	5200	700	1000	600

TABLE 2 DIMENSIONAL DETAILS OF ANCHOR BLOCK AND ITS FOUNDATION FOR NET SBC 15T/SQM.* AT FOUNDING LEVEL

TYPE	ANCHOR BLOCK				ANCHOR BLOCK FOUNDATION			
	A	B	C	D	E	F	G	H
1	<2000	3800	600	4400	2800	400	1000	600
2	2000 — 4000	3800	600	4400	3400	600	1000	600
3	4000 — 6000	3800	600	4400	4000	700	1000	600

* NET SAFE BEARING CAPACITY OF SOIL AT FOUNDING LEVEL SHALL BE VERIFIED AT SITE BY TAKING TRIAL PITS AS DIRECTED BY THE ENGINEER.

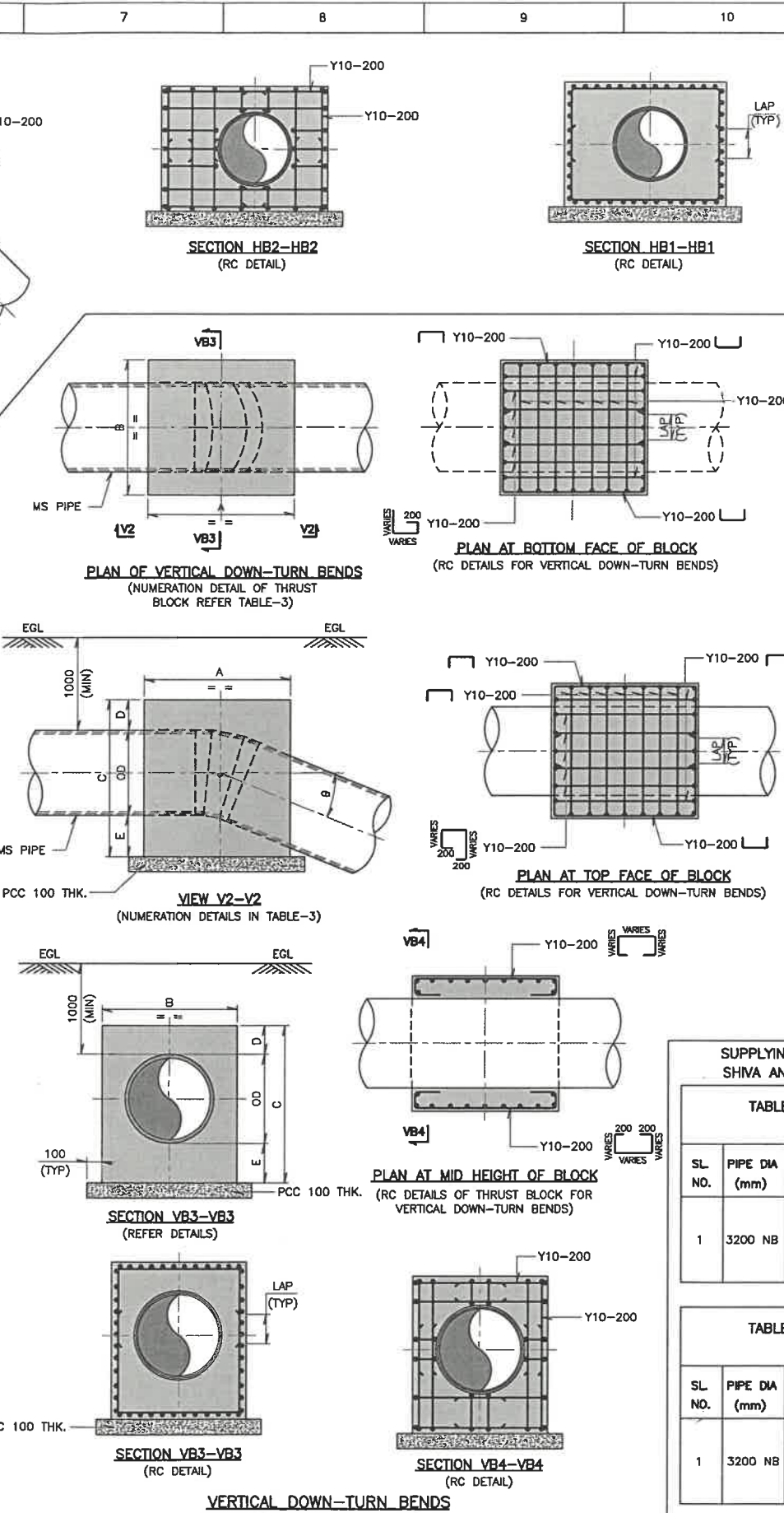
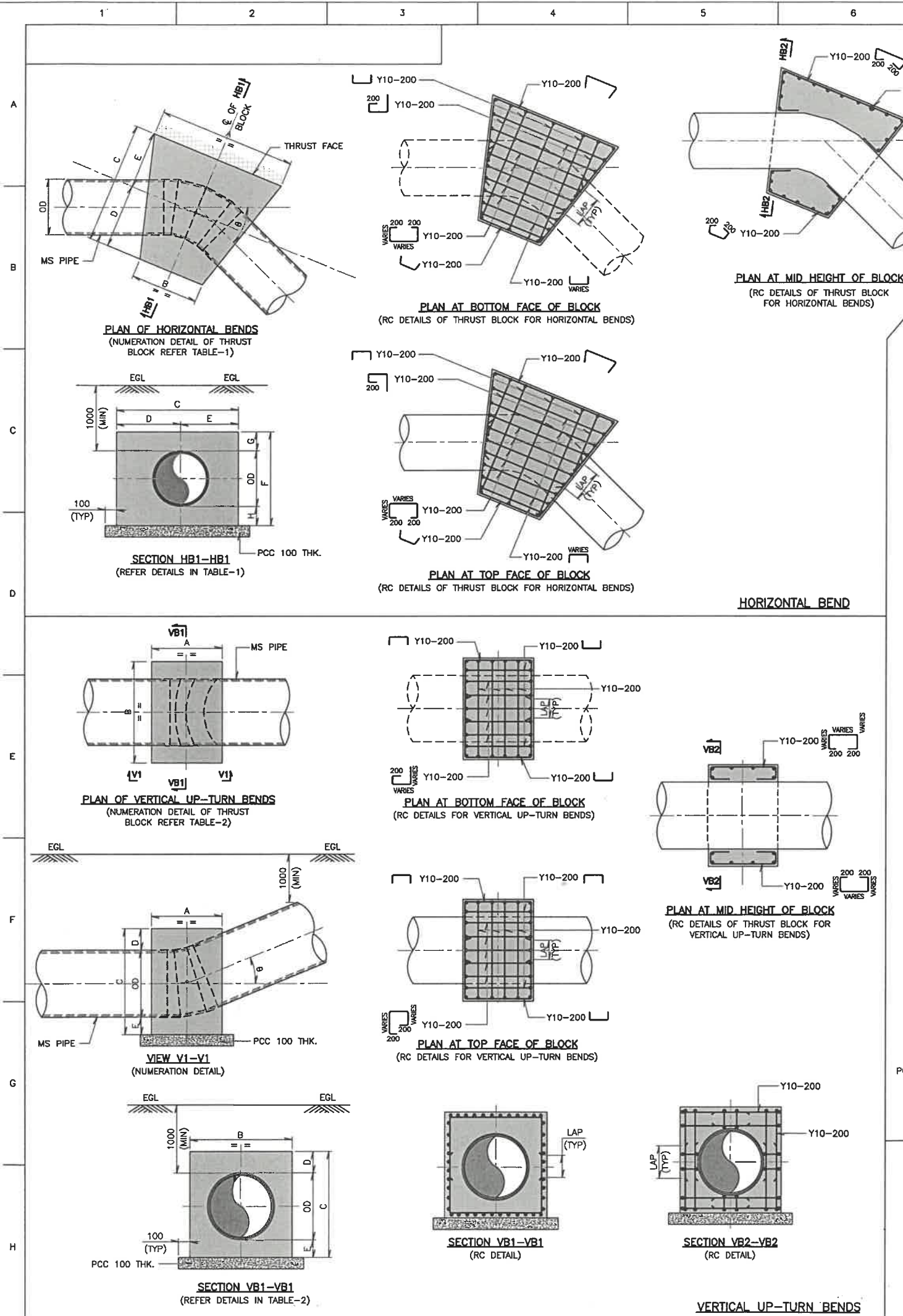


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BANGALORE WATER SUPPLY AND SEWERAGE BOARD
RAW WATER TRANSMISSION MAIN FROM SHIVA ANICUT TO SHIVA BALANCING RESERVOIR

ANCHOR BLOCK AND ITS FOUNDATION FOR 3200 MM ID PIPE (COVER TYPE)

SCALE: AS SHOWN DWG. NO. EXHIBIT-12 ISSUE PO



LEGEND :

TYP - TYPICAL
THK. - THICKNESS
PCC - PLAIN CEMENT CONCRETE
OD - OUTER DIAMETER
RC - REINFORCED CONCRETE

MM - MILLIMETER
M - METER
EGL - EXISTING GROUND LEVEL
MS - MILD STEEL
MIN - MINIMUM

- NOTES**
- ALL DIMENSIONS ARE IN MILLIMETRES AND LEVELS IN METRES UNLESS NOTED.
 - GRADE OF CONCRETE SHALL BE M25 WITH MINIMUM CEMENT CONTENT WITH 20mm & DOWN SIZE AGGREGATES FOR VALVE CHAMBER AND CONFORMING TO IS 456:2000.
 - GRADE OF STEEL REINFORCEMENT SHALL BE TMT BARS OF GRADE Fe500 CONFORMING TO IS:1786.
 - PLAIN CEMENT CONCRETE UNDER FOUNDATION SHALL BE OF MIX 1:3:6 WITH MINIMUM CEMENT CONTENT WITH 40mm & DOWN SIZE AGGREGATES CONFORMING TO IS 456.
 - SAFE BEARING CAPACITY OF SOIL IS TAKEN AS 15T/Sq.m AT FOUNDING LEVEL.
 - FOOTING SHALL BE FOUND ON FIRM VIRGIN SOIL AT DEPTH INDICATED. IF ANY LOOSE SOIL/STRATA IS ENCOUNTERED AT FOUNDING LEVEL OR GROUND WATER TABLE IS ENCOUNTERED DURING CONSTRUCTION IT SHALL BE BROUGHT TO THE NOTICE OF THE ENGINEER FOR REDESIGNING THE SAME.
 - CLEAR COVER TO REINFORCEMENT
a. BASE SLAB - 50mm, b. WALLS - 45mm (SOIL FACE & FREE FACE), c. TOP COVER SLAB - 25mm, d. BEAM - 30mm, e. PEDESTAL - 50mm (ALL FACES).
 - DEVELOPMENT LENGTH, LAP LENGTH & ANCHORAGE LENGTH SHALL BE 50 X DIAMETER OF SMALLER BAR.

THRUST BLOCKS ARE DESIGNED FOR STANDARD BEND ANGLES AND PIPE PRESSURE AS PER HYDRAULIC CALCULATION. ANY VARIATION IN BEND ANGLES AND PIPE PRESSURE SHALL BE BROUGHT TO THE NOTICE OF THE ENGINEER FOR REDESIGNING THE SAME.

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SUPPLYING AND LAYING OF RAW WATER TRANSMISSION MAIN FROM SHIVA ANICUT TO SBR - 3200MM ID MS PIPE OF LENGTH 2.5KM

TABLE 1: SCHEDULE OF THRUST BLOCK SIZE FOR VERTICAL DOWN-TURN BENDS

SL. NO.	PIPE DIA (mm)	ANGLE OF BEND (°)	A (mm)	B (mm)	C (mm)	D (mm)	E (mm)
1	3200 NB	>5° TO 11.5°	1700	3700	3797	250	250
		>11.5° TO 22.5°	2000	3700	3797	250	250
		>22.5° TO 45°	3400	3700	3797	250	250

TABLE 1: SCHEDULE OF THRUST BLOCK SIZE FOR VERTICAL UP-TURN BENDS

SL. NO.	PIPE DIA (mm)	ANGLE OF BEND (°)	A (mm)	B (mm)	C (mm)	D (mm)	E (mm)
1	3200 NB	>5° TO 11.5°	1700	3700	3797	250	250
		>11.5° TO 22.5°	2000	3700	3797	250	250
		>22.5° TO 45°	3400	3700	3797	250	250

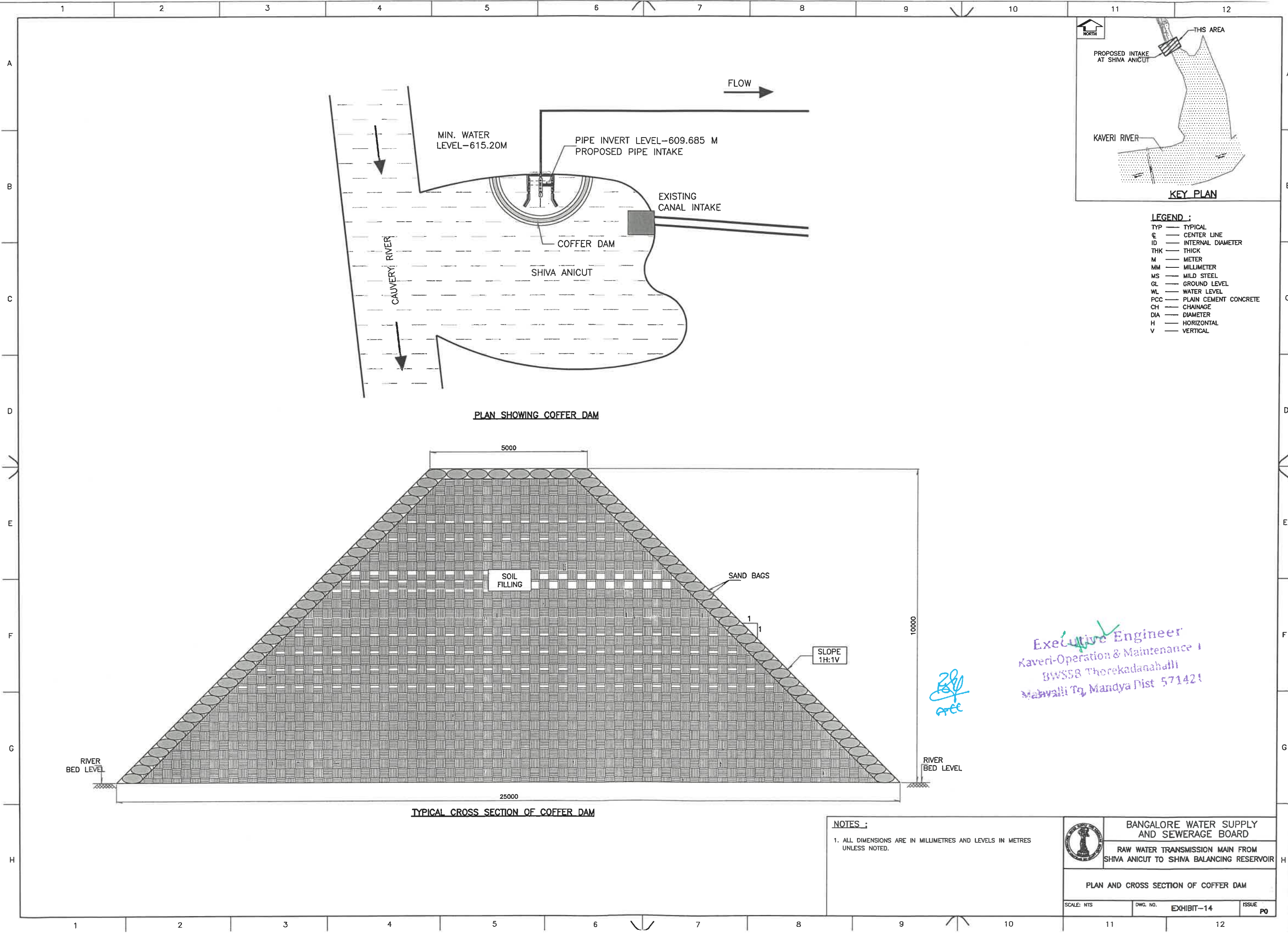
TABLE 3: SCHEDULE OF THRUST BLOCK SIZE FOR HORIZONTAL BENDS

SL. NO.	PIPE DIA (mm)	ANGLE OF BEND (°)	A (mm)	B (mm)	C (mm)	D (mm)	E (mm)	F (mm)	G (mm)	H (mm)
1	3200 NB	>5° TO 11.5°	600	600	3700	1750	1750	3697	200	200
		>11.5° TO 22.5°	1000	1000	3700	1750	1750	3697	200	200
		>22.5° TO 45°	2000	2000	3700	1750	1750	3697	200	200
		>45° TO 90°	3800	3800	3700	1750	1750	3697	200	200

BANGALORE WATER SUPPLY AND SEWERAGE BOARD
RAW WATER TRANSMISSION MAIN FROM SHIVA ANICUT TO SHIVA BALANCING RESERVOIR

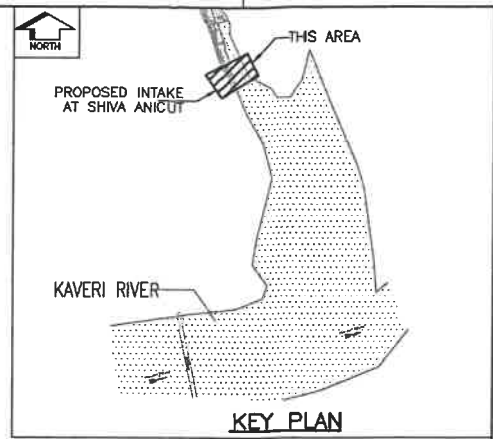
TYPICAL GENERAL ARRANGEMENT & RC DETAILS OF THRUST BLOCKS FOR 3200 MM ID PIPELINE

SCALE: AS SHOWN DWG. NO. EXHIBIT-13 ISSUE PO



A
B
C
D
E
F
G
H

A
B
C
D
E
F
G
H



- LEGEND :**
- TYP — TYPICAL
 - CL — CENTER LINE
 - ID — INTERNAL DIAMETER
 - THK — THICK
 - M — METER
 - MM — MILLIMETER
 - MS — MILD STEEL
 - GL — GROUND LEVEL
 - WL — WATER LEVEL
 - PCC — PLAIN CEMENT CONCRETE
 - CH — CHAINAGE
 - DIA — DIAMETER
 - H — HORIZONTAL
 - V — VERTICAL

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NOTES :

1. ALL DIMENSIONS ARE IN MILLIMETRES AND LEVELS IN METRES UNLESS NOTED.

	BANGALORE WATER SUPPLY AND SEWERAGE BOARD		
	RAW WATER TRANSMISSION MAIN FROM SHIVA ANICUT TO SHIVA BALANCING RESERVOIR		
	PLAN AND CROSS SECTION OF COFFER DAM		
SCALE: NTS	DWG. NO.	EXHIBIT-14	ISSUE PO